



CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

FIRST OF TWO SECTIONS

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A Wing & A Prayer

As network outsourcing takes off, CIOs are betting on the benefits

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Textron CIO William Gauld sees rising capability for a lower cost and less hassle

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Mail Orders of Magnitude

How data mining helps Fingerhut market smarter

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Chef Information Officers

IT in the restaurant biz

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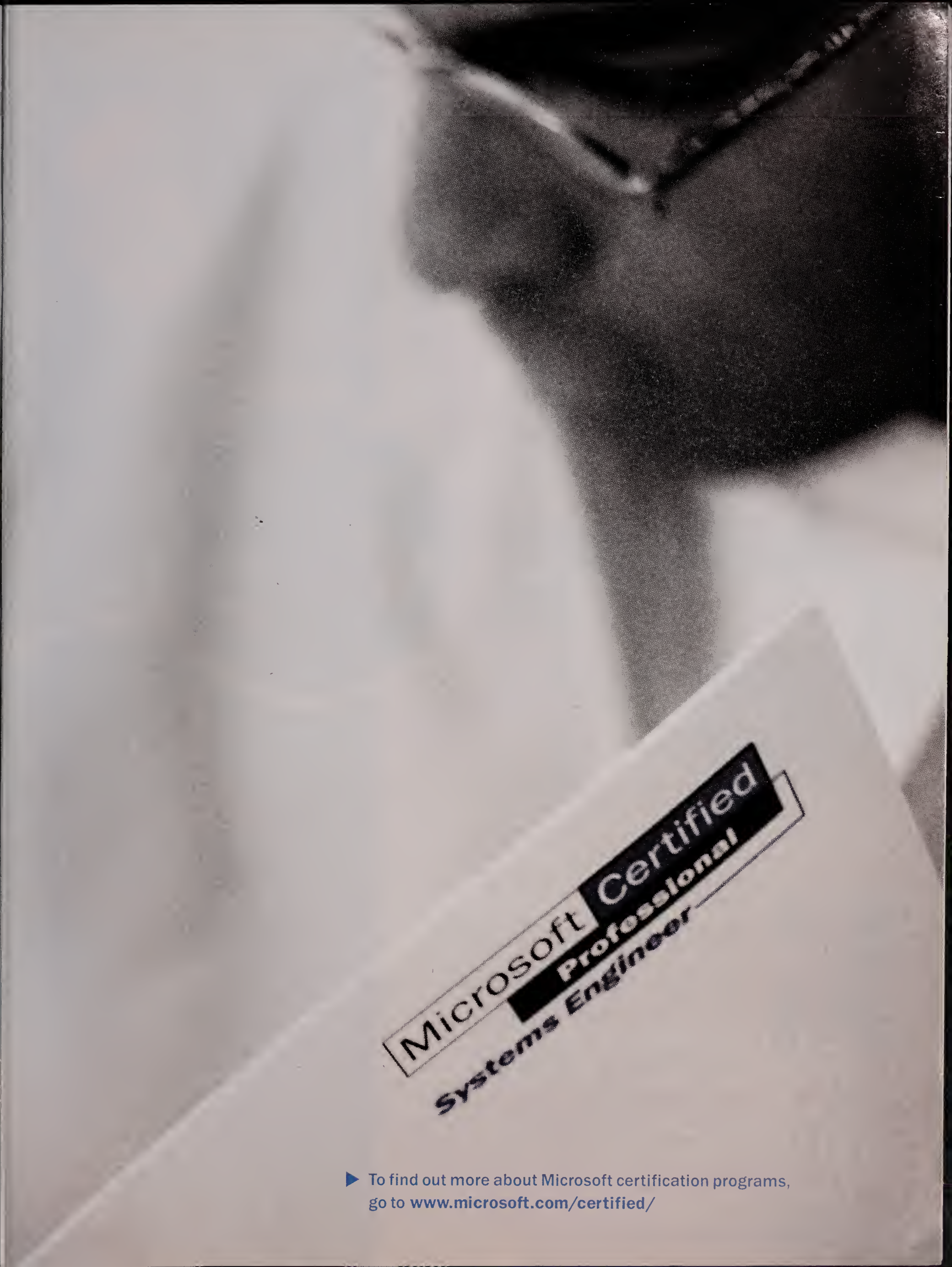
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Will handing a stranger the keys to the company network keep you awake at night?

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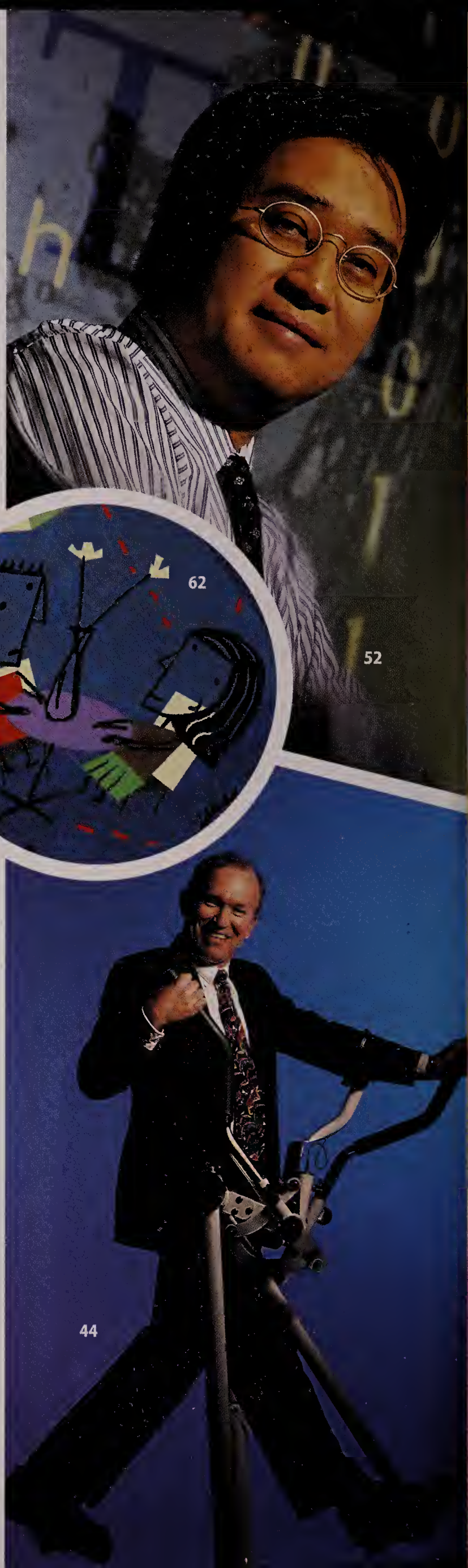
By Alice Dragoon



ON THE COVER:

The challenges and rewards of network outsourcing have propelled Textron CIO William Gauld to new heights.

Cover photo by Marnie Crawford Samuelson



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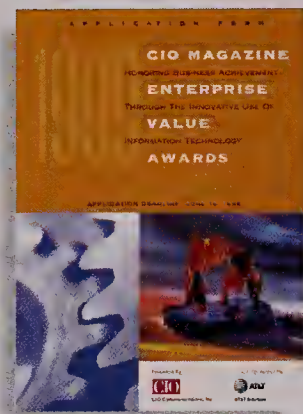
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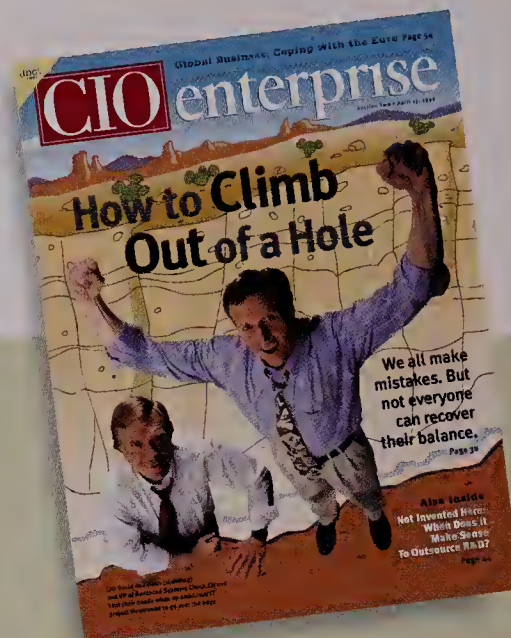
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INTERNATIONAL BUSINESS Europe's new currency may very well rock the business world and your company's IT systems.

BUSINESS MANAGEMENT Supporters of complexity theory believe that the secret to a more creative and productive workforce lies in some simple rules of nature.

REALITY BYTES Our new obsession with tracking corporate knowledge purports to save money. Does it also stifle creativity?

INTELLECTUAL CAPITALISM Has your knowledge management system become a junkyard of unusable data?

CHECKS & BALANCES The IT Process Landscape can help clarify IT's value for those who pay the bills.

LEARNING CURVE Firewalls connote those safety frontiers that guard your invaluable corporate data. And your sanity.



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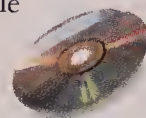
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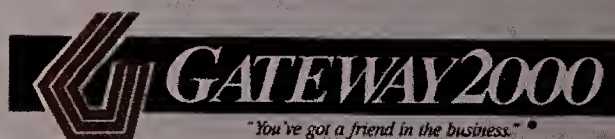


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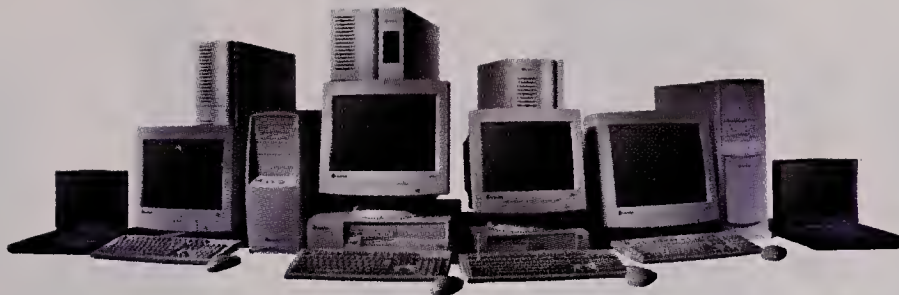
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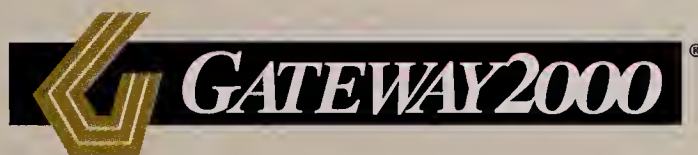


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LETTER FROM THE EDITOR, READER FEEDBACK
AND HOW TO REACH US

I'm wrestling with complexity, and I have to say, it's getting the best of me. Part of my job is to read all the articles in an issue before it goes out the door and look for connections (other than those we've planned) in the content. Now that *CIO* consists of two full-size sections, this is quite a job.

In this issue, I've been reading about how IT is transforming the food service industry, the use of data mining for target marketing at Fingerhut and why the switch to a single European currency unit (the euro) has CIOs and CFOs on both sides of the Atlantic in a sweat.

To my point about complexity, consider this: Fingerhut began in Manny Fingerhut's garage, where he made and sold seat covers for cars. The company now employs 200 market analysts and 40 statistical scientists who use several hundred intricate, proprietary mathematical formulas to segment markets into niches and make all sorts of complex marketing decisions.

In Section 2, we discuss the euro—which would appear to simplify commerce by creating a single currency for all participating countries. But, in fact, it creates untold complexity for companies doing business in Europe. For at least the first few years, conversions to or from one member country's domestic currency must convert first through the euro. Financial systems don't currently support such a three-way conversion process. And that's just the beginning.

Even basic industries—food service, for instance—are turning to sophisticated information systems. The fact that *CIO* Jodie Ray has ended a 30-year career at Texas Instruments to head up IT at restaurant conglomerate Brinker International is indicative of the growing importance of IT.

These are times of transition. Some of the pain of complexity is due simply to the fact that we're not there yet. Perhaps the toughest task in this environment is to distinguish between the complexity that's going to bring the insight, connectedness and clarity that will take us to the next level and the complexity that will paralyze organizations when the next shift comes.

Some people say the answer is to use less technology. This can be a seductive stance. But as defeated as I sometimes feel by my own inability to keep up with the seemingly endless spiral of complexity, I really do believe that much of what we're experiencing now is the unavoidable result of being in a state of profound transition. What do you think?

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CHECK YOUR CHESSBOARD

I enjoyed your special report on strategic planning ["What's Your Move?" CIO Section 1, Jan. 15, 1998]. However, while chess is an apt paradigm for strategic thinking, you've got to get your baseline straight. The chessboard is set up incorrectly in your cover picture: The outermost right-hand square on the first rank (at "h1," in chess notation) should be white rather than black as shown. I know because I learned the lesson well when I was 4 years old. At a major chess tournament in Spain, I had helped set up the board for my father, the late International Chess Grandmaster Nicholas Rossolimo, and still recall my embarrassment when he had to rotate the board by 90 degrees and reset the pieces!

Alexander N. Rossolimo

*President
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SURVEY SAYS WHAT?

I read with interest a survey of 139 IT buyers in the Dec. 1, 1997, issue of CIO Section 2 [Threads, "Are Thin Clients a Fatheaded Idea?"]. The reasons these buyers chose not to roll out thin clients made me howl with laughter:

"Not a PC: 44%"

"Lack of Windows compatibility: 23%"

"Lack of support for standard peripherals: 21%"

"Not upgradable: 18%"

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Letters may be edited for length or clarity.

I would classify these under the category of "Totally Missing the Whole Point." If these people are making IT buying decisions, they need some basic understanding of what makes up a thin client architecture and how it is used effectively.

Mark DeArmon

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mdearmon@tacticsus.com*

TIME TO SET A DATE-TIME STANDARD

Do we believe we can build and operate a passenger airliner that can't crash? How about an unsinkable passenger ocean liner? Maybe a bulletproof vest—guaranteed? How about unbreakable computer systems?

The point is, as Senior Writer Derek Slater pointed out in his excellent article "Happy Days 2000" [CIO Section 2, Nov. 15, 1997], the tremendous far-reaching value of, for once, thoroughly inspecting and actually working on our existing systems is being diminished by the lack of management demand for a date-time standard in all



technologies that is just as tough as 5,280 feet equals 1 mile, or the requirements for the width of interstate railroad tracks. It has become apparent to those of us making systems year 2000 compliant that date and time are as elemental to humans and therefore human/machine interactions as oxygen. When will I have it? Are you done yet? Your appointment is at 10 p.m., etc. Yet there are companies that use different date-fix schemes in their different software... more deferred maintenance? Hell, Microsoft sold me Office 97 with defective date schemes. Excel and Access have different roll dates; Outlook's Us calendar is a joke. Let's not just fix Y2K. Let's realize date-time is elemental and treat it as such.

Dick Brich

*Data Processing Supervisor
City of North Platte
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Publisher's Note

The unpredictability of the IT business is, in fact, its most predictable aspect. The IT industry reinvents itself every decade or so, according to the theory of Frank Gens, senior vice president of worldwide research for International Data Corp., a sister company to CIO Communications Inc. And,

the theory goes, after each reinvention there's an opportunity for a relatively unknown vendor at the time of the change to find itself as the industry leader.

Simple, isn't it? And it basically holds up. In 1950 the commercial mainframe business hit its stride. Seven years later, International Business Machines, a small player in 1950, led the industry. Minicomputers achieved their first marketplace success in 1965. By 1972 Digital Equipment Corp., a virtual unknown before 1965, led the sector.

With 1980 dawned the era of the personal computer. Seven years later Microsoft, a programming-language company in 1980, had produced the first version of Windows, was working on Windows 2.0

and dreaming about the big coming-out party for Windows 3.0, the product that sent Microsoft into the stratosphere.

In 1995 Netscape popularized the World Wide Web with its easy-to-use browser. Hmm. Who will lead the industry by 2002?

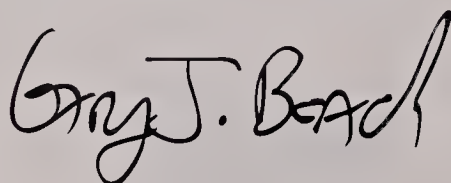
Every year IDC has asked 1,600 IT users this open-ended question: "Which IT company is most important to the success of your organization's Web-based business projects?" The results of that survey for the past three years are shown at right.

As you can see, "Don't Know" made a big comeback in the latest survey with greatest mind-share in the Wild, Wild Web.

How would you answer that question? Who do you think will be the leading Web vendor in 2002? Drop me an e-mail at the address below.

My prediction: No names, but I bet it will be a vendor involved with low earth orbiting satellites.

Scotty, beam me to the May 1 issue. In the coming two weeks, may you digitally live long and prosper.



Gary J. Beach
gary_beach@cio.com

Which vendor is most important to your Web projects?

	1995	1996	1997
Microsoft	6%	26%	24%
IBM	3%	3%	10%
Netscape	14%	10%	3%
Sun Microsystems	3%	1%	1%
Oracle	0%	2%	1%
Don't Know	50%	39%	46%

SOURCE: IDC GLOBAL IT SURVEY, 1998

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Trendlines

NEWS, INSIGHT, HUMOR, REVIEWS

Edited by Sara Shay

Space Savers

PEN TABLETS Know any knock-about road warriors in need of unusually resilient hardware? They might be tempted by a pen tablet PC that recently made it back home from the road least traveled. Astronaut Kalpana Chawla had Fujitsu Personal Systems Inc.'s Stylistic 1000 strapped to her thigh when the Space Shuttle Columbia blasted off last November. The pen tablet, which connects to the shuttle's on-board computer system, displays data from the shuttle's own system about the shuttle's location relative to the Earth; previously, landing information was available only on paper printouts.

So far, thick-gloved astronauts have used the tablet with Windows-based Worldmap designed by Johnson Space Center's Space Operations Computing programmers (or SPOC, of course) to visualize the shuttle's orientation and predicted touchdown point. After further testing, NASA hopes these "knee board" computers will enable astronauts to select abort-mission and automated-landing scenarios in the event of a communications breakdown. More down-to-earth users of the approximately \$3,000 tablet and its Fujitsu siblings, the Stylistic 1200 and the



Point 510, include health-care workers, who rely on them for radio-assisted access to patient records, and insurance and other roaming sales agents. Zero-gravity thigh strap not included. For more information, call 408 982-9500 or visit www.fpsi.fujitsu.com. ■

Are You Being Served?

RESTAURANT I.T. It was a typical Saturday night at Ted's Café Escondido, a 100-seat Mexican restaurant in Oklahoma City, and the top-notch hostess who'd just been recruited from TGI Friday's was at her wit's end. Every last table was packed, and the 120 hungry patrons on the waiting list were quickly losing their patience. At the end of the night,

owner and President Ted M. Curtis found her in tears and ready to quit. Curtis persuaded her to stay, assuring her that help was on the way.

A few weeks later, Curtis installed Dallas-based Rock Systems Inc.'s ProHost table service management system, which helps the hostess figure out which tables are available and when. Each table has a read switch that busboys activate by swiping a magnet attached to a



Restaurant management software eliminated long waits at Ted Curtis's Café Escondido.

<http://www.cio.com>

ILLUSTRATION BY DAVID BAMLUND; PHOTO BY DOUG HOKE

Objects

Business Challenges

Building Solutions for your



Overview by

 **IDC**
INTERNATIONAL DATA CORPORATION

Use of Object Databases Skyrocketing

By Steve McClure

Analyst, International Data Corp.

The ODBMS market, currently a small fraction of the overall DBMS market, will continue to grow rapidly.

TODAY'S ENTERPRISES HAVE EMPLOYED SYSTEMS TO automate most of the obvious back-office and, more recently, front-office applications. Any competitive advantages derived from that automation activity is diminishing. To find other information technologies to leverage for competitive advantage, organizations are turning to the Inter-

net/intranet and to a richer set of data types.

To keep pace with customer needs, companies are scrambling to extend the capabilities of their systems to support Internet-enabled applications and the multimedia data types typically found on the Web. The Web promises global access from a "universal client."



ILLUSTRATIONS BY CHRISTOPHER BING

The vast amount of information in today's enterprises is not the type of data traditionally stored in relational databases. These other types of information are instead kept in files, spreadsheets or, most likely, in non-digital form. The solution they are turning to is object technology.

But before they do so, IT organizations need to understand the differences between the approaches and solutions available in the marketplace. For example, understanding the difference between object database management systems (ODBMSs) and object-relational DBMSs (ORDBMSs) is crucial to the success of these endeavors.

Modern businesses need object databases. The march of technology has accelerated the pace of change. To respond to this force as well as events such as legislative changes, an enterprise must frequently modify its business processes.

In doing so, it may seek to achieve a combination of goals such as greater integration internally and with external stakeholders; greater mastery of the details of its business model; and increased business agility, so it can respond faster to a competitor's initiatives. And we are seeing this today.

In a poll of 15,400 sites last year, International Data Corp. found 23.1% of them involved with ODBMSs; 7.4% had

approved their use for production applications and 15.7% had actually deployed such applications. These numbers indicate that the ODBMS market, currently a small fraction of the overall DBMS market, will continue to grow rapidly.

Since IT will continue to play a critical role in meeting business needs, the next generation of business applications must, of course, be standards-based, distributed and secure, and inherently scalable. They must also:

- Be rapidly adaptable.
- Be able to model the business accurately.
- Offer high availability and reliability.
- Offer information (as well as data), including information from external sources.
- Offer richer types of data.

These requirements can be applied to DBMSs as well. The DBMSs that complement the next generation of business applications must support:

- Complex data, extended data types, user-defined types and abstract data types.
- Object-oriented and component-based application models.
- Complex data relationships.
- Rapid application development.
- Rapid accommodation of change.
- High availability/reliability.
- Interoperability in secure, distributed, heterogeneous systems and networks.
- Inherent scalability.
- Easy-to-use access/analysis.

Of the database technologies available today, ODBMSs best offer the support for the requirements listed above.

An ODBMS can do more and can be used in a wider variety of situations than its relational or object-relational counterparts.

DATABASE CHOICES

Users can now choose from three categories of DBMSs: relational (RDBMS), object-relational (ORDBMS) and object (ODBMS).

For applications involving high volume, routine transactions on simple data types and simple data relationships (e.g., master-detail), RDBMSs may be the best choice. They have been finely tuned to perform this kind of processing.

Most RDBMSs also have the ability to store images as large binary objects (BLOBs), but cannot do any processing based on the content of the BLOB. In RDBMSs, navigating complex relationships requires time-consuming multiple joins of the relevant tables.

RDBMS vendors have gone beyond BLOBs by extending their database engines to support the indexing and retrieval of additional data types, such as images, based on content. Underneath their ORDBMSs are still server-centric RDBMSs, but in adding this extended data type support, they compromise the perfor-

Continued on back page

ABOUT THE AUTHOR

Steve McClure is the primary researcher, writer and consultant for IDC's Object Tools market planning service. This service focuses on all aspects of object technology, including object-oriented analysis and design, object-oriented programming and object database management systems.

COMPANIES ARE TURNING TO OBJECT DATABASES TO STORE INCREASINGLY COMPLEX AND EVER-EXPANDING VOLUMES OF DATA.

ODBMS: The Time Has Come

By Emily Kay

Today's toys are colorful amalgams of moving parts, sophisticated electronics and eye-popping special effects. But most toy makers can only depict them in static photos in paper catalogs that do not do them justice.

Linea GIG S.P.A., a toy maker as well as Italy's largest toy distributor, sought a more dynamic approach to display its wares. It wanted a sleek electronic catalog in which it could promote its full line of toys with images, sound and video. Dott. Giorgio Pezzin, managing director of GIG, wanted the multimedia catalog to "capture that same sense of wonder and delight" that children have when playing with their favorite toys.

To build and maintain such a catalog, the company chose Jasmine™, the object-oriented DBMS from Computer Associates International, Inc. CA's new information management offering not only enabled Pezzin to achieve his goal, but allowed him to do so in

under three months. That's because Jasmine combines a pure object-oriented database with an integrated development tool, built-in multimedia support, a robust multi-platform deployment facility, and the openness to integrate with existing applications and data.

"By storing information as objects, we can compose next-generation applications very quickly, maximizing object application code reuse," says Pezzin. Jasmine's object database manages multimedia information and complex relationships among business objects "much better than a relational or hybrid database can," he adds.

Today's electronic catalogs must be exciting, easy to use and a fun experience for the shopper.



Object DBMSs (ODBMSs) have been around for years. Yet, only recently have growing numbers of organizations turned to such products to store increasingly complex and ever-expanding volumes of data from a myriad of media. One reason for this

rising interest is that object databases represent "the way users access data today," says Marc Sokol, senior vice president of advanced technology for CA.

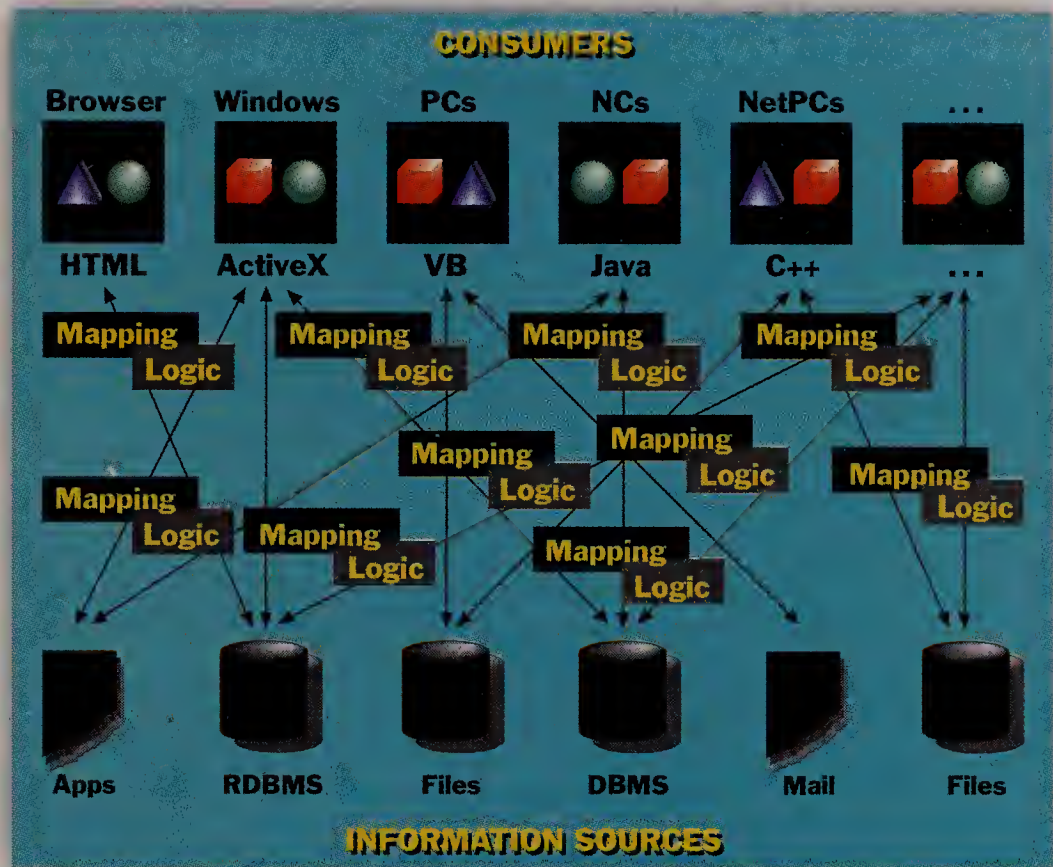
That is why Jasmine has impressed corporate and third-party software developers. "Jasmine's pure object-oriented database solution [provides users with] a more natural and intuitive environment to manipulate complex information," says Ray Wilkes, vice president of sales for AltaVista Internet software at Digital Equipment Corporation. Jasmine's flexibility is also a big plus. Corporate users who need to link up to legacy RDBMSs can connect natively to OpenIngres®, Oracle, Informix, Sybase, SQL Server, CA-IDMS®, CA-Datcom®, DB2, VSAM and others. Meanwhile, OLE DB support provides report writers and decision-support tools with access to Jasmine.

Object technology also allows companies to cut application development time dramatically and significantly reduce support and maintenance costs. This is because Jasmine's pure object-oriented database enables developers to create objects once and reuse them many times quickly and inexpensively. Developers can "build high-performance, scalable, content-rich, Web and client/server applications in a fraction of the time" it would take to use standard RDBMS technology, says Wilkes.

"Jasmine has the ability to store complex data objects as true objects and not just blobs of data. This greatly simplifies the development of complex applications."

**— Michel Barry
Technical Director, L'Oreal**

Incredible Card Corp., an application developer in Hicksville, N.Y., can attest to that. Jasmine helped cut application development time in half for the firm, which makes smart cards that provide doctors and emergency service technicians with instant access to a child's medical profile. According to Charles Fishman, chief technical officer, development projects used to take



▲ Traditional approaches that must map consumers to information sources lack flexibility, create redundancy, and are difficult to manage.

a minimum of 30 days; now they take less than two weeks. "Instead of trying to fit complex data into the mold of a relational database, we work purely with objects as objects," says Fishman. At Incredible Card, a child is essentially an object that has parents, fingerprints, pharmacist and doctor information. "If I need to develop another instance of a child, it's all replicated down to the fingerprint level," he adds.

Third-party developers who are extending their technology through Jasmine integration appreciate CA's open-systems model. They can create applications by using the drag-and-drop GUI of Jasmine's integrated development tool, called Jasmine Studio. But they can also choose a development language or tool they are more familiar with, such as Java, Visual Basic, native HTML, C, C++, or any ActiveX tool, to deploy applications in any environment—ranging from private networks to the Internet and corporate intranets/extranets. According to Fishman, "There are other pure object databases, but Jasmine is open and more robust."

LONG-AWAITED PROMISE

ODBMS products are not exactly new on the scene. However, the reason they have not taken off is because they didn't offer the minimum feature set required to support



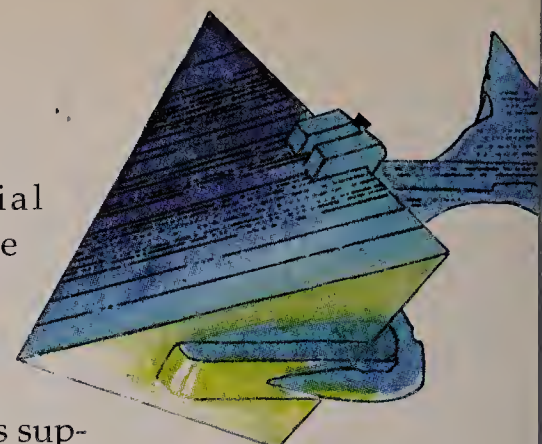
businesses. Companies that have marketed ODBMS products for nearly a decade sold them mainly into specialty scientific niches. Acceptance by the general business community was lacking.

In 1997, mainstream database vendors like Oracle and Informix Software began adding object support to their RDBMSs. But these hybrid products (Oracle8, Informix Universal Server), with their limited object-relational capabilities, have fallen short of corporate users' requirements. Market research firms expect pure object databases to do better. Christopher P. Selland, research director with The Yankee Group in Boston, called Jasmine "a revolutionary product, which we believe may be able to achieve the long-awaited promise of object databases."

Why do experts expect Jasmine to have such a profound impact? Built from the ground up as a pure object database based on proven technology from Fujitsu Ltd., Jasmine is an unadulterated object-oriented database engine that can incorporate data such as graphics, video, sound and spatial coordinates that do not fit easily into relational database rows and columns. Previously, a company could capture at best 15% of all the data it manipulated. Jasmine, notes CA, can manage *all* of an organization's information—including audio, video,

animation and financial instruments—over multiple platforms, including the Internet.

Investment institutions, for example, value Jasmine's support for objects that deal with time series analysis (which helps them understand stock market trends and fluctuations) and other non-traditional data. Jasmine allows these firms to access such complex information via Web browsers, says Richard Newman, executive vice president of Innovative Systems Techniques Inc. (Insyte), a software developer in Newton, Mass. Insyte's clients, which



"An object database provides the best performance for the kind of work we do. And Jasmine is the only object database that offers mission-critical features. Unlike competing products, it is built for the business world."

*—Hans Georg Hack
IT Manager, Ehapa*

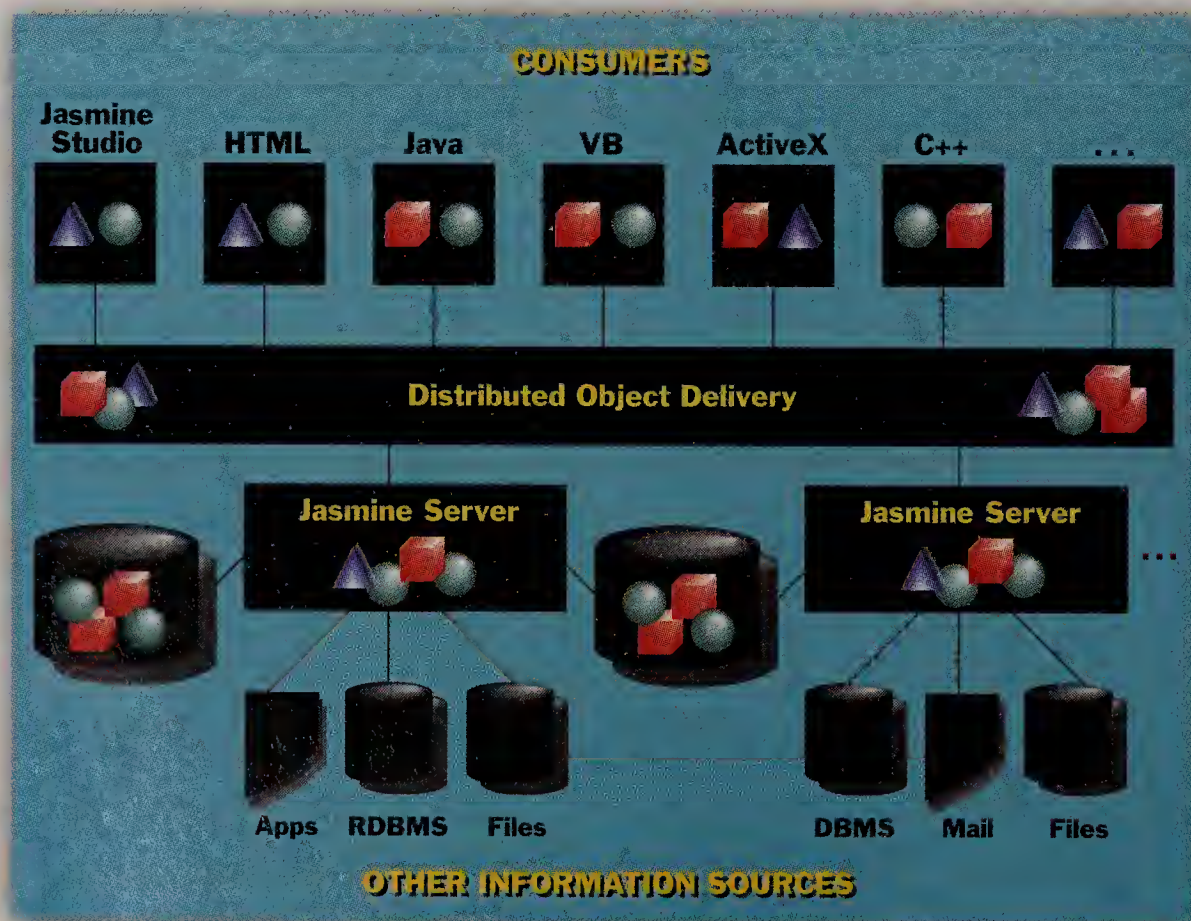
The pure object architecture of Jasmine supports the dynamic nature of today's business environments by providing all consumers with access to all information sources. ▼

include T. Rowe Price and Putnam Investments, must evaluate analysts' ratings of companies, stock prices and financial analyses over a period of time. Insyte uses Jasmine to construct for clients complex databases that can allow them to view and hear analysts

discussing specific stocks.

The rows and columns of relational databases don't accommodate the intricacy of corporate information, much of which is neither text nor numeric. Because object databases are better at managing complicated interrelationships between entities like inventory levels and customer order records, they are far better suited for complex data types than traditional relational databases.

Another factor propelling the need for object databases is the wide-



spread use of the Internet and corporate intranets and extranets. With Web technology pushing multimedia applications to vast numbers of users worldwide, organizations require corporate databases to do more than store and retrieve simple information-like words and integers. Enterprise databases must possess the capability to manage and deliver complex data quickly to large numbers of users, over multiple platforms. They must also be able to maintain and update the data quickly and easily.

For instance, Jasmine will allow Toyota of Australia to move its multimedia-rich interactive accessories catalog to the Web, says Kevin Smith, national parts and accessories systems manager. Planned for installation in the 500 Toyota dealerships throughout Australia, the easy-to-use Jasmine-based point-of-sale application combines graphics, audio and sound, making it fun for customers to browse accessories and "build the car of their dreams," says Smith. "If they want to see the car equipped with a rear spoiler, or all dressed up with the sports package, a mere click of the mouse changes the image accordingly."

Toyota built the application to expand sales of its

opment environment that was seamlessly integrated with the database to meet our prototype development schedule."

Jasmine will enable Smith's team to deploy the Windows NT-based system on the Web to provide access to customers in the Middle East, Southeast Asia, and the Pacific. "That's another one of Jasmine's strengths," says Smith. "The same version of an application can be deployed wherever we choose—in a standalone (kiosk) setting, on client/server systems and on the Web. This is accomplished without recoding or recompiling."

Jasmine-based application lets Toyota customers build the car of their dreams.



"Jasmine allowed us to build an interactive, multimedia Internet self-training application. Jasmine was the right solution for a number of reasons. It is a true object-oriented database with full multimedia support. And it's Web-enabled, so we can create one application that anyone on the Internet or intranet can access."

—Eric Robandt
Communications Strategist, Telia Data

own accessories to car buyers at the time of initial purchase instead of losing their add-on business to auto supply stores. But to beat off-brand competitors to market, Toyota had to build it quickly. The huge amount of rapidly changing information required a robust and flexible database, which Jasmine supplies. "There is no other way to efficiently store the kind of elaborate multimedia we intended to use," says Smith. "And we didn't have the time to fiddle around with difficult programming languages. We needed an intuitive, visual devel-



CONCLUSION

Object databases are finally coming into their own. As users discover how much more efficient it is to store objects in an object database, and how their newly created applications better mirror their business, ODBMSs will grow in popularity. "Jasmine's top-to-bottom object-oriented architecture is very appealing to us," says Michel Barry, technical director of cosmetics maker L'Oreal. "The database stores video as video, audio as audio, and images as images. Jasmine provides the optimum solution for centralizing and managing complex information."

Furthermore, the Internet and E-Commerce will only give object databases added impetus. "The rapid growth of the Internet is driving a new breed of applications that incorporate complex data, like video, animation and sound," says Alexis dePlanque, senior research analyst with Meta Group, a research firm in Stamford, Conn. "Products like Jasmine will fall into the sweet spot of IT development as companies focus on robust, complex Web implementations."

Emily Kay writes about technology as a principal with Choice Communications, an editorial consulting firm in Chelmsford, Mass.

mance advantage of RDBMs, because indexing schemes that had been highly tuned for six data types must now be generalized.

As a rule, ORDBMs do not support navigational processing through complex data relationships very well. Grafting object support onto RDBMs is not good engineering. Putting object extensions on RDBMs is tantamount to adding stereo radios and global navigation systems to horse-drawn carriages. You'll have interesting enhancements, but the wrong base vehicle. In the end, it won't be the appropriate vehicle for the information superhighway.

A pure object DBMS can do more and can be used in a wider variety of situations than its relational or object-relational counterparts. This is because ODBMs are designed to incorporate the latest innovations in database technology. They provide direct, efficient one-to-one support for applications written in object-oriented languages, e.g., Java. They also allow both the application and the database to naturally represent the application domain model of business. And they inherently provide both the broadest support for new data types and superior performance for applications with complex data relationships.

Since ODBMs best support the needs of modern businesses, IDC predicts that the level of ODBMS adoption will continue to increase rapidly for the foreseeable future.



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Chip Gliedman, Area Director, Research,
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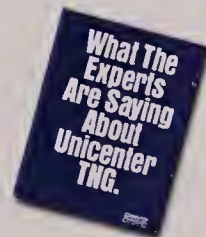
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Trendlines

bungee cord, so the hostess knows instantly when a table has been cleared. The system also feeds a message screen in the back that tells the kitchen staff how many people are in the restaurant and on the waiting list as well as how many are being seated per minute. Since Ted's installed the ProHost system, the number of times tables turn in a day has increased from 8 to 13.

Curtis has also equipped servers, managers and busboys with pagers. When a party is seated, the table's waiter is paged; the kitchen staff pages servers when their orders are ready or when they've run out of an item. Customers can page waiters by pressing a call button built into each table's condiment stand. Every hour, two busboys get a page reminding them to clean the bathrooms. Once they finish, they swipe a read switch that sends a page to a manager saying the bathroom is clean and prompts the busboys to wash their hands. If a bathroom needs attention between scheduled cleanings, customers can push a button in the bathroom that sends another page to a busboy as well as to a manager. "Thirteen-hundred people can trash a bathroom," says Curtis.

While Curtis believes in allowing customers to make menu substitutions, the practice has led to order mix-ups and friction between cooks and wait staff. To solve the problem, he installed Micros Systems Inc.'s 2700 touch-screen terminals with custom software that lets servers ring in any order and prints slips in the kitchen detailing the specifics. "Suddenly, nobody was screaming at each other anymore," says Curtis. "If people want to screw the menu up, they ought to be able to do it. The customer is truly right."

"Some people say technology takes all the friendliness or humanness out of a restaurant," adds Curtis. "That's just baloney. Employees can't do their jobs without the proper tools."

For more information on IT in the restaurant industry, see "Come and Get IT," Page 62.

—Alice Dragoon

Off the Shelf

Leader, Replace Thyself

**The Leadership Engine:
How Winning Companies Build
Leaders at Every Level**

By Noel M. Tichy, with Eli Cohen
HarperCollins Publishers, 1997, \$26

NOEL M. TICHY, A PROFESSOR AT THE University of Michigan Business School, writes that "the ultimate test

for a leader is not whether he or she makes smart decisions and takes decisive action but whether he or she teaches others to be leaders and builds an organization that can sustain its success even when he or she is not around." Having interviewed, studied and copiously documented the activities of a number of well-known business leaders, mostly from big U.S. businesses, Tichy reveals how winning organizations "build leaders at every level." Here's Jack Welch abolishing General Electric Co.'s uniform pay scale so that bright people from even the lowest levels of the conglomerate bureaucracy will be encouraged to step forward and lead with their ideas. There's Intel Corp.'s Andrew Grove wrinkling his nose at the idea of formulating sophisticated business models in favor of teaching leadership to his managers.

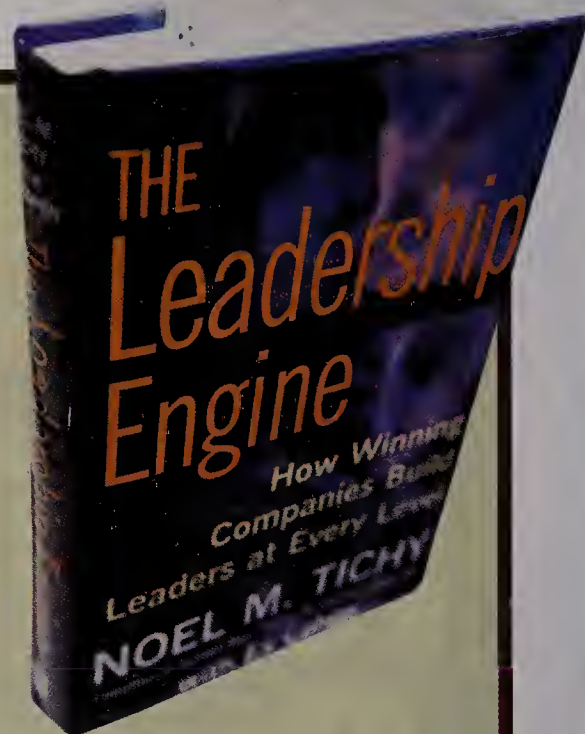
Tichy says leadership is not only about getting people to reach for common goals by helping them see aspects of the world differently but also about developing successors who can follow suit. Such leadership, we learn, was behind the success of PepsiCo Inc., Hewlett-Packard Co., AlliedSignal Inc., Compaq Computer Corp., Ameritech Inc. and The ServiceMaster Co. LP. According to Tichy, leadership is the most important factor behind the "sustainability" of many a successful company's growth.

Much of the first half of this 367-page volume is filled with case studies, quotes and anecdotes, and most stories are told from the CEO's perspective. (Notable exceptions are mentions of Eleanor Josaitis, head of the Detroit civil rights organization Focus: HOPE, and her predecessor, Catholic priest Bill Cunningham. The pair started the program in the late 1960s to provide food for at-risk mothers and infants; it now trains inner-city citizens for high-tech jobs and runs a for-profit machine shop that in 1995 sold \$10 million worth of parts a year to the auto industry.) The second half of the book comprises a "Handbook for Leaders Developing Leaders," which includes worksheets, exercises and pointers, and a notes section that provides references to rich source material, such as books, magazine articles, videos, university studies and Web sites, as well as slides from pertinent presentations his sources have given. While the exhaustive documentation is the mark of a career academician, the writing is conversational and engaging throughout.

One could argue that this book amounts to nothing more than an exhortation to do careful and thorough succession planning. But there's clearly more to consider here than how to prepare an organization for the day its leader steps into the path of the proverbial speeding truck.

Especially in these short-staffed times, it is a wise IT leader who sees to it that managers at all levels are grooming troops for upward mobility. That individual will find *The Leadership Engine* a helpful guide.

—David Pearson



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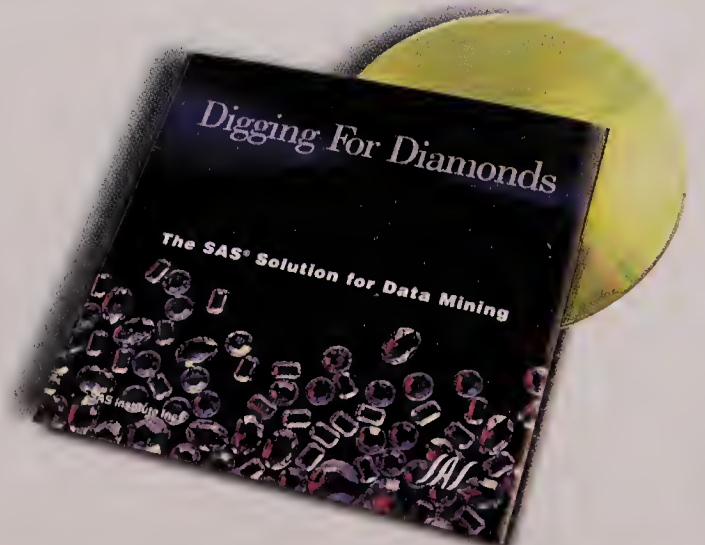
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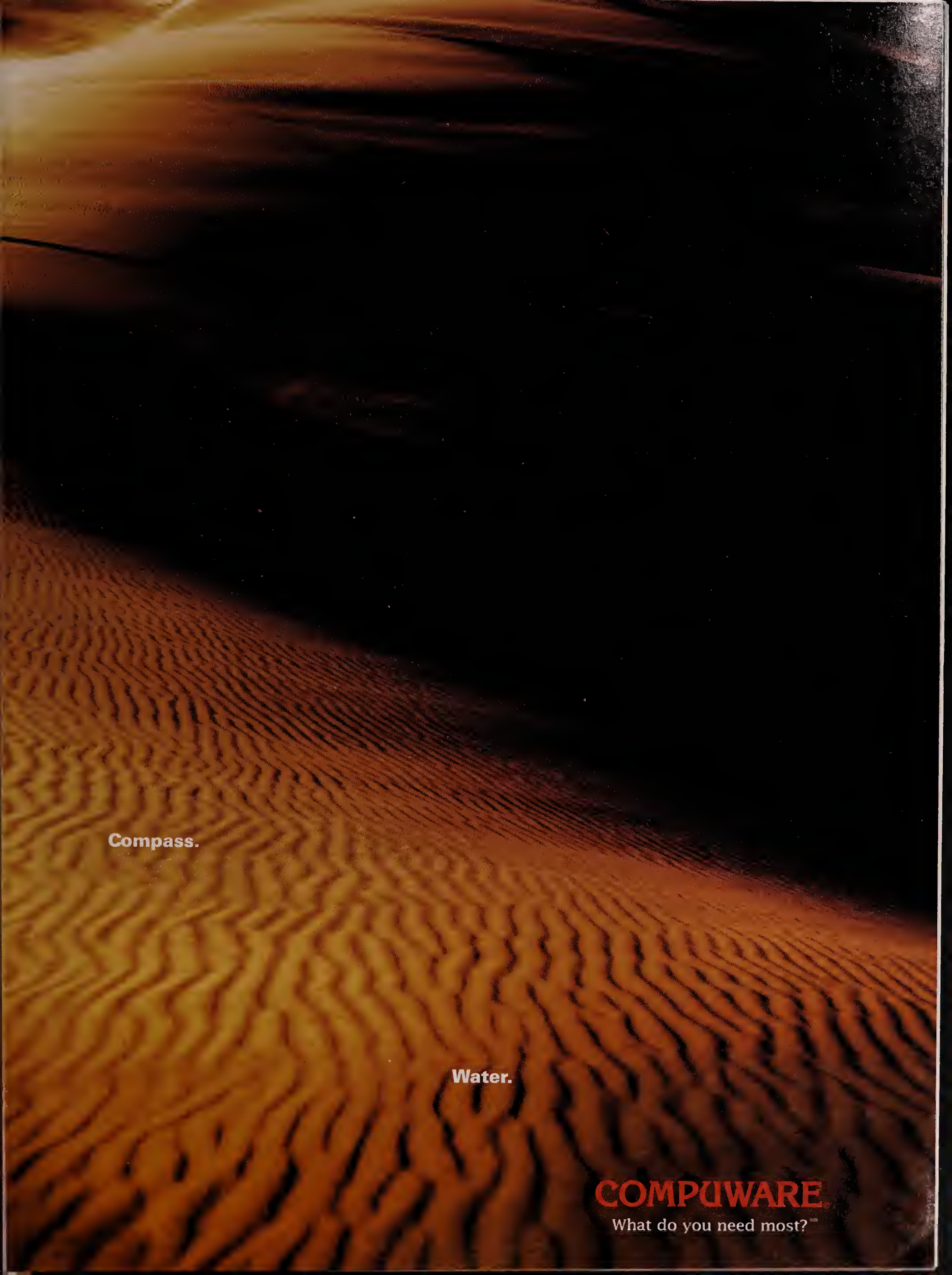
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Trendlines

New School Ties

CORPORATE FUNDING The belief that computers are a vital part of a first-rate education has driven one state university system to make an unprecedented deal with leading IT behemoths.

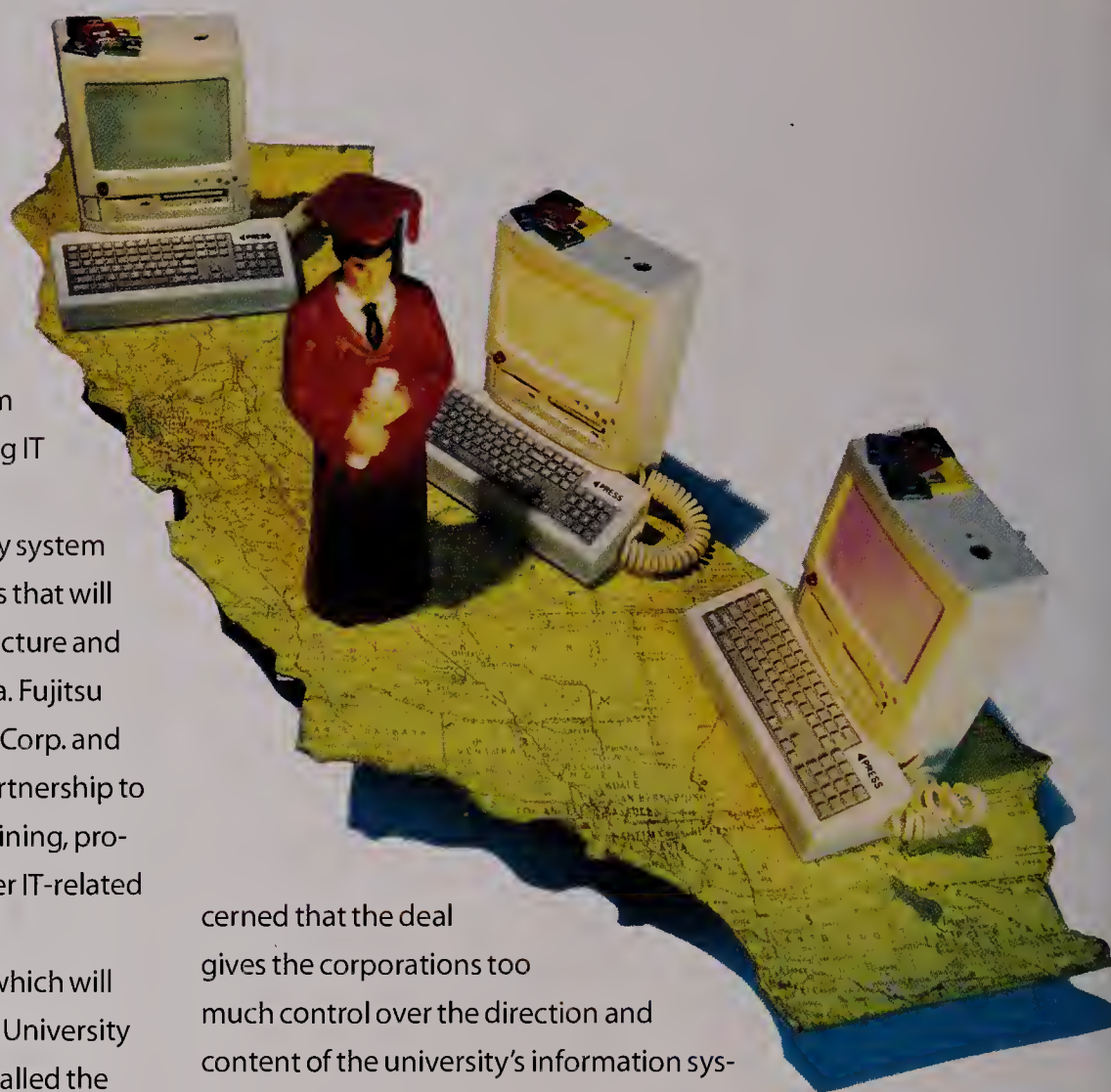
The 23-campus California State University system is working with a quartet of corporate giants that will develop and deploy its technology infrastructure and wire its campuses with voice, video and data. Fujitsu America Inc., Hughes Electronics Corp., GTE Corp. and Microsoft Corp. have formed an industry partnership to take over such tasks as network support, training, procurement, help desk management and other IT-related work for CSU.

But the 10-year plan, the initial phase of which will cost \$300 million, is drawing some protests. University administrators argue that the partnership, called the California Education Technology Initiative (CETI), is necessary because of high-technology costs and the state government's refusal to allow the system to charge students a fee for upgrades and maintenance to the information technology system. But CETI has generated much controversy among faculty and students con-

cerned that the deal gives the corporations too much control over the direction and content of the university's information system. They also fear the agreement will give the companies a captive audience for their wares.

CETI is expected to start in May after a review by faculty and staff is complete and is slated to continue for 10 years. The plan calls for CSU and the four corporations to form a nonprofit entity with a for-profit subsidiary that would procure and provide hardware and software to the campuses. The individual campuses would receive their annual IT budgets through the normal state funding process and would have the choice of purchasing upgrades through CETI or from some other entity if they didn't find CETI's offerings to be competitive. At the same time, CETI would fund the upgrades of the voice, video and data systems at all the campuses.

CSU had little choice but to enter into the unique partnership with the information technology leaders, according to Spencer Freund, associate vice president for academic affairs and telecommunications at the Sacramento campus, and a member of the CETI implementation team. "The state has not been forthcoming in giving us the necessary capital to enrich our infrastructure, nor have the students wanted to pay increased fees or sanction changes to the tuition program to pay for necessary upgrades," he says. "What choice is there? Do we then provide a second-rate education because we can't afford the best there is? Or do



ON THE RIGHT TRACK, BUT...
The Massachusetts Bay Transportation Authority has just approved a \$6.6 million plan to solve the year 2000 problem. The real problem: It's a five-year plan. The MBTA does intend to replace its IBM mainframe with a newer model in time for the actual millennium change, but it won't trash the mainframe entirely for five years.

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Trendlines

we do something that is surprising and innovative? I think other campuses will follow us on this."

Freund discounts the notion that the campuses would be forced to buy all IT equipment through CETI, pointing out that they can go elsewhere if they find a better deal. "CETI expects to offer hardware and software at very competitive prices, and the campuses will be encouraged to consider them or to allow CETI to negotiate a deal for you," he says. "But if you are, say, looking for a switch, and Fujitsu's is too expensive, you can look elsewhere. And just because Microsoft is involved doesn't mean we won't be using Netscape. We have made it clear that other technologies, like Apple computers and Netscape, are very important to us."

At the same time, Freund admits the implementation of the program has not been smooth. "Any time you do something this new and different, there is going to be controversy," Freund says.

—Mindy Blodgett

This'll Ripple The Steno Pool

HIGH-TECH NOTE TAKING Taking notes by hand on paper may be old-fashioned, but for many of us, it's a method whose charms have not yet been eclipsed by the merits of more modern solutions, such as the laptop



Q U O T A B L E

"We converse with a lot more people via the Internet only to discover that most of them are talkative idiots, just like at the office."

—Orson Scott Card, science fiction writer

Source: *The Book of Truly Stupid Business Quotes*,
by Jeff Parietti (HarperCollins Publishing, 1997)

or PalmPilot. Until now.

Enter the CrossPad, a portable digital notepad that comes with a pen that spews real ink on real paper. To use the CrossPad, you slide a regular 8.5-inch by 11-inch pad of paper on top of it, uncap the accompanying pen and write away. With every stroke, the ergonomically designed pen, which contains a tiny motherboard, sends a radio frequency signal to the CrossPad. Because the pen and pad communicate by signal rather than pressure, you can use any thickness of notepad (it's been tested using up to 75 sheets).

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The CrossPad is the brainchild of the Cross Pen Computing Group, a startup division of A.T. Cross Co., maker of more traditional writing implements, and uses technology developed by IBM Research. It's coming to stores this month, and retails for \$400. For more information, call 800 510-9660 or visit www.cross-pcg.com. ■

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Executive Counsel *Edited by Sara Shay*

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Details, Details

When you transfer IS staffers as part of an outsourcing deal, make sure you supply them with precise information about the move

BY KEVIN F. SHERRY

Dear Valued Employees: We've fired half of you and sold the other half to some company you've never heard of. Best wishes.

—Your former boss

THAT'S THE KIND OF MORNING memo that can give employees whiplash and put a CIO out of the running for Boss of the Year. When a company sends a portion of itself, such as the IT department, to work for another enterprise as part of an outsourcing deal, employees necessarily enter uncertain territory. To help them as much

as possible, CIOs need to make sure someone is guiding them every step of the way until they safely complete the transition. If you send the emotional equivalent of the above memo, you may find your hallways littered with employee roadkill.

The key to orchestrating a successful transition for the IT staff from old company to new is being straightforward about what is going to happen and providing support for employees who are affected. Everything from preparation to the big goodbye should be done with the knowledge that whatever you do will inevitably cause

stress within the department—and that those same folks will still be working for your organization, only under a different flag.

"Even though they will not be your employees, they will continue to do your work," says Gwen L. Barker, human resources consultant and principal of Logenii, a Minneapolis company that provides IT workforce transformation support to Fortune 500 companies. And no company wants to send bitter employees to an outsourcer.

Plan Ahead

In any outsourcing deal there are bound to be glitches, but advance planning can help minimize the problems. Rick Sayers, a managing director of human resources for business process outsourcing at Price Waterhouse LLP in Cleveland, works with companies to keep their loyal troops happy as they send them off to toil for another. He recommends holding a mock Q&A session to help the CIO and his or her boss anticipate questions that will come up when management decides to break the news about an outsourcing deal and working to formulate the thoughtful answers employees deserve. Sometimes, he says, he runs into a corporate mind-set that wants to clamp down on the information going to employees before anything is signed because "it's not a deal 'til it's a deal."

That's just the kind of mind-set that makes employees edgy, says Rita Terdiman, vice president and research director for the Gartner Group Inc.'s External Service Providers practice in Stamford, Conn. "Don't think that you can keep it a secret at all," she says. It's best to avoid the "surprise party" method of breaking the news, mostly because attempts at hiding the news will be unsuccessful. Someone will have a friend whose sister is involved with the deal, and word is bound to slip. Terdiman recalls that employees at one company learned



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some behind-the-scenes information after one vendor—oops—left the original of a critical document in the photocopier.

Good Timing

Ideally, the same day the company selects an outsourcer, employees affected by the deal should be told a deal has been made. People will figure that something is up when the rumor mill lets out that a parade of lawyers was seen heading into the conference room. "You have to at least move at the letter-of-intent stage," Sayers says. At that point, company officials need to let employees know how the outsourcing process works and provide them with a rough timetable of what comes next, even if the vision of the future remains uncertain.

Choosing an outsourcer to supply services should take no more than about nine months, Barker says. Assuming that most employers let their staff know that outsourcers are being considered, nine months is about the point at which

employees gets antsy. No one wants to wait around staring at the writing on the mouse pad. With a strong economy and great job market, valuable employees will take control of their own destinies and bolt. CIOs should keep an eye on their calendars, or they're likely to find themselves in an empty office.

In Transition

Once the deal has been sprung, the transition period officially begins, and dispensing information—complete, accurate information—becomes vital. Bethlehem Steel Corp., for example, made a point of being open about the details of its outsourcing deal with Electronic Data Systems Corp. from day one. About six years ago, the Bethlehem, Pa.-based company began a 10-year, \$500 million outsourcing contract with Plano, Texas-based EDS not only to save money and streamline its IT department but also to expose its IT people to better training and a wider variety of technologies.

Roughly 400 company IT employees and 250 contract workers were affected by the decision, and the deal had a ripple effect on dozens of other Bethlehem departments, such as public affairs, legal, labor relations and consulting, as well as the company's suppliers and customers.

From the beginning, employees yearn for clarity. They will be clamoring for any morsel of information that transition managers can offer them, and companies typically use everything in their pantry to sate this craving. The proven style of the company will decide how that information gets to them, whether it's via e-mail, meetings or carrier pigeon. "The culture is really the driver of what's going to succeed," says Longenii's Barker.

Bethlehem Steel used both a structured and an ad hoc approach to keeping employees up-to-date during its initial transition and afterward, says Thomas Conarty, director of IT. Meetings represented the structured approach. A general meeting hosted early on by current

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managers for affected employees addressed issues like benefits and insurance that were common to everyone. Within two weeks, similar scenes played out on increasingly smaller scales, first with the subgroups of different employee categories and finally with separate teams, small working units and even individual employees. At these meetings employees and their managers talked about transi-

issues great and small or to access the latest information about timetables or their new jobs. People were also invited to send their questions and concerns to an e-mail service. Open-door management sessions and a program that paired old managers with new ones taught managers all they needed to know, giving them information about major issues like new company policies as well

At Bethlehem, managers "certainly wanted to eliminate unhealthy forms of conflict," Conarty says. Translation: stifling the dreaded rumor mill that invariably accompanies any outsourcing deal. That's when Betty from operations knows someone in her carpool who overheard someone say that for sure the new company will cut benefits, make people do more work and require employee ID tags to be tattooed on everyone's forehead.

Everyone knows that rumors are always more interesting than facts. Through communal e-mail postings and voice mail, Bethlehem's transition team made sure they flushed out as many juicy rumors as possible and then either confirmed or denied them.

Other companies have found ways to make the rumor mill actually work to their benefit, Barker says with a certain delight. In one company, rumors were running rampant that a particular vendor had been selected. When focus groups met, coordinators would talk pointedly

Everything from preparation to the big goodbye should be done with the knowledge that those same folks will still be working for your organization, only under a different flag.

tion issues specific to their own departments.

The ad hoc approach covered the "lesser" concerns of the information spectrum. The transition team set up an internal telephone number that workers could call to leave messages about

as advice about finer points such as how to order a pencil. Employees had periodic town hall meetings with both Bethlehem and EDS execs, and employees even published a four-issue mini newspaper that dealt solely with transition topics.

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Executive Counsel

in general terms about the pros and cons of the various vendors still being considered, knowing full well that their ambiguous comments would circulate and give workers the truthful impression that no decision had yet been made. "It was a way to work through the rumor mill," Barker says. "But it was factual."

Answer the Questions

Once an approach for distributing information has been established, Sayers says CIOs can begin addressing their employees' most basic concerns: Do I have a job, and for how long? What are my benefits? What is my compensation? After that come the "softer" but no less important issues that vary from person to person: Does the new employer offer day care? Will we work in offices, open spaces or cubicles?

When dealing with the onslaught of questions, CIOs should be committed to honesty. Never fudge an answer that you don't know or that hasn't been determined, Sayers says. Instead, give the questioner a timetable for when an answer will be available and track those to-be-answered questions to make sure none gets neglected. Ignoring even one question can be damaging. "Credibility is certainly more important than an expedient answer," Sayers says. "When we give an answer, it's etched in stone."

No matter how frivolous they may sound, all questions should be taken seriously. Terdiman once received a phone call from a couple of employees who had a question about the host of companies that were lined up as potential employers: "They wanted to know who would allow them to dress down on Fridays," she says. Such seemingly superficial concerns should never be trivialized because if that's what's important to employees, then that's what CIOs need to make sure the company that wins the outsourcing contract addresses. And if an outsourcing deal involves 500 people, then be prepared for 500 different combinations of issues. "If a vendor doesn't get that that's important," Barker says, "it can really put a twist into how people view that outsourcer."

Confidence Building

Employees need consistent in-person support from the CIO and his or her dele-

gates in the early stages of the outsourcing deal to remind employees that someone is available to help them. For example, CIOs at the old company can invest in events designed to foster trust and camaraderie in the new managers. Special get-to-know-us affairs or offsite happenings with both the new and old companies remind employees that they're still a team during the transition process.

Once major topics have been hashed

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out and comparatively minor announcements are not likely to spark a flurry of new questions, both company and contractor still need to monitor any changes in the effectiveness of the way employees receive their information. If new information seems to be emerging hourly, photocopied memos likely won't keep up with word-of-mouth and could signal that it's time for a move to e-mail or some other instant delivery system. The sure-fire information-delivery method that works just fine today may be the wrong approach for tomorrow. "It's hard to categorize any one silver bullet because the silver bullet for weeks one or two might not be the best thing for years one or two," Bethlehem's Conarty says.

CIOs can raise workers' confidence

levels by stressing the positive aspects of the transition and reinforcing just how significant their new jobs will be. At the old company they were just one important cog in a giant machine. Now, they are the machine. That's a big selling point in getting people to switch, says Sayers, and one new employers can use to rally their adopted workforce: "You've never been on the front line. You've always been in the back office. This is the front line of this company. This is what we do."

CIOs should also make sure the IS staff doesn't have any major surprises on the first day at their new jobs. Continuity of work is key: On the first day at the new company, employees should do exactly what they did for the old company. "Whatever [they did] yesterday, they're doing today," Sayers says.

After that, the new employer can build on the employees' confidence to add new skills and training until they get to the point where they're serving more clients than just their old employer. On top of that, employees will notice that these new skills make them more marketable and therefore more valuable.

Back at the old company, the job for the CIOs and the other top managers is far from over. They must be careful not to neglect the people who are left behind after the outsourced folks take off, whether they're in the same department or another. "The remaining organization flips into a shock mode," Barker says. "They're going to be thinking, 'Are we next?'" Maybe, maybe not. The employees will be focused on the recent past, but CIOs can refocus them on their current work and keep them posted about any future changes.

Sometimes people forget that even under the most uncertain and stressful times, employees still have a business to run. No matter what the terms of the outsourcing deal, keeping people informed benefits employers in ways they might not have realized initially. The outsourcer also benefits when its future staff has a flood of timely, accurate information because it imparts a confidence that will help build an energized, enthusiastic workforce. **CIO**

Kevin F. Sherry is a freelance writer based in Los Angeles. He can be reached at KFS614@aol.com.

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Architecting Architecture

The total economic benefits of an enterprise architecture initiative seem self-evident. But how to manage events to obtain every advantage for your company is not quite so obvious.

BY MARC CECERE

WHEN IT COMES TO I.S. PROJECTS, diverse systems are the enemy of flexibility and cost control. If departments and geographically dispersed offices go their own ways, IS budgets soar. Increasingly, information executives, consultants and technicians look upon controlling and fortifying the internal logic of an enterprise's IT architecture as the best means to make consistent the hodgepodge of software and hardware found in most corporations. But the creation of an enterprise IT

architecture has among its goals more than keeping the budget at less-than-astronomical magnitudes; nor is it an exercise in reengineering, knowledge management, out-of-the-box thinking or any other particularly trendy management approach. Because effective enterprise IT architectures connect decentralized organizations where decision making and accountability are scattered, such an architecture can be accomplished only by solid planning, project management and vendor negotiations.

When Giga Information Group Inc. set out to create a three-tiered analysis of companies engaged in enterprise architectural development, we studied 10 companies, 6 for general purposes, 3 in-depth and 1 as the basis for a detailed case study. All the companies we studied have annual revenues greater than \$1 billion. We chose companies with geographically dispersed functions such as sales and customer service because that kind of company requires large, complex IS infrastructures. We were also interested in companies that had frequent interactions with their

customers. With those prerequisites, most of the companies we studied had to be in financial services.

Enterprise IT architecture is a far-reaching concept that comprises the vision, principles and standards that govern the acquisition and deployment of technology. As such, it provides the foundation for detailed data, application and network architectures. An enterprise IT architecture is a key component of a mature IS organization that enables alignment with business goals, consistent processes and best practices in software reuse. Furthermore, it is an effective tool for reaching Levels 2 and 3 of the Software Engineering Institute's Capability Maturity Model, the standard five-stage metric of an IT shop's competencies. At Level 2, an IT shop is able to repeat tasks it is given; at Level 3, a shop's overall organizational mission is defined (see "Out-of-This-World Software," CIO, Feb. 15, 1995; available online at www.cio.com/archive/021595_cmm.html).

Unfortunately, many enterprise architecture efforts become stalled or canceled because the primary target of expectation setting is senior management, who, given the history of large project failure, want immediate results. Enterprise architecture efforts are expensive, and significant quantitative benefits will not be realized until well into the later phases of the implementation effort. However, if the project manager focuses on benefits that can be realized quickly and on setting realistic expectations among coworkers, benefits that support the business case for a dramatic change in enterprise architecture can be realized and the effort can be sustained.

MOST SUCCESSFUL ARCHITECTURE implementations occur in four overlapping phases: planning, initial migration, major application migration and post-migration (see "Re-architecting:



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Giga View

A Case Study," this page). The subject of our case study, a Northeast financial services company, has a 7,500-person user base, 500-person IT department, one primary IT location, multiple, small satellite offices and a CIO who has direct reporting relationships with all IT personnel. Its infrastructure consists of IBM Corp. mainframes, four e-mail systems, four primary DBMSs, Novell Inc. file servers and Microsoft Corp. Windows NT application servers. Also, numerous packages exist for accounts payable, customer and inventory tracking, and other functions.

Phase 1

Planning: During this phase, the organization develops a business case for the enterprise IT architecture rollout, defines principles of action and technology standards, and plans the timing of future transitions. Phase 1 also identifies "quick hit" opportunities—principles and standards that could be implemented rapidly and would result in immediate, visible benefits.

During the planning phase, IT managers from the case study company created an IT inventory, articulated a business case for the architecture project—including an implementation plan that comprised deliverables, milestones, resources required, schedules and costs—and formed a working architecture implementation team. Business and IS representatives had agreed on several key principles by which the project would go forward, and they viewed that new spirit of collaboration to be a tremendous achievement because until then cross-divisional relationships were occasionally antagonistic. For example, they agreed to have only one IT product per business category. In practice, they settled on a corporate standard of Microsoft Office with Microsoft Exchange for e-mail, a standard that implied that business units would have to migrate from Lotus Development Corp.'s Lotus Notes, Lotus 1-2-3 and other products.

The principle would yield long-term benefits for purchasing and supplying support, but the business and IS reps understood that settling on a standard would yield little value in the near term.

Phase 2

Initial Migration: During Phase 2, the company migrated to the "quick hit" standards identified in Phase 1. The implementation team negotiated contracts, deployed software and hardware, and established support services such as training and help desks. Since any new systems will put employees at the bottom of a learning curve, there were, in addition, nonquantifiable costs for customer service and productivity degradation because of personnel's lack of familiarity with new tools and processes.

During Phase 2, the enterprise IT architecture implementation team convinced the organization that the business case for the rollout was valid and that funding and participation should be broadened. In our case study, the CIO under-

stood that IS's lack of credibility in delivering large projects on time and within budget required some near-term results that demonstrated the value of an architecture. Without this, commitment by participants and business units could be lost. To counteract that possibility, the CIO created a business case that clearly identified tangible near-term benefits. As part of the interior salesmanship for the project, as an example, he pointed out that PC standardization would save \$75,000 annually through greater purchasing power from a single vendor.

Phase 3

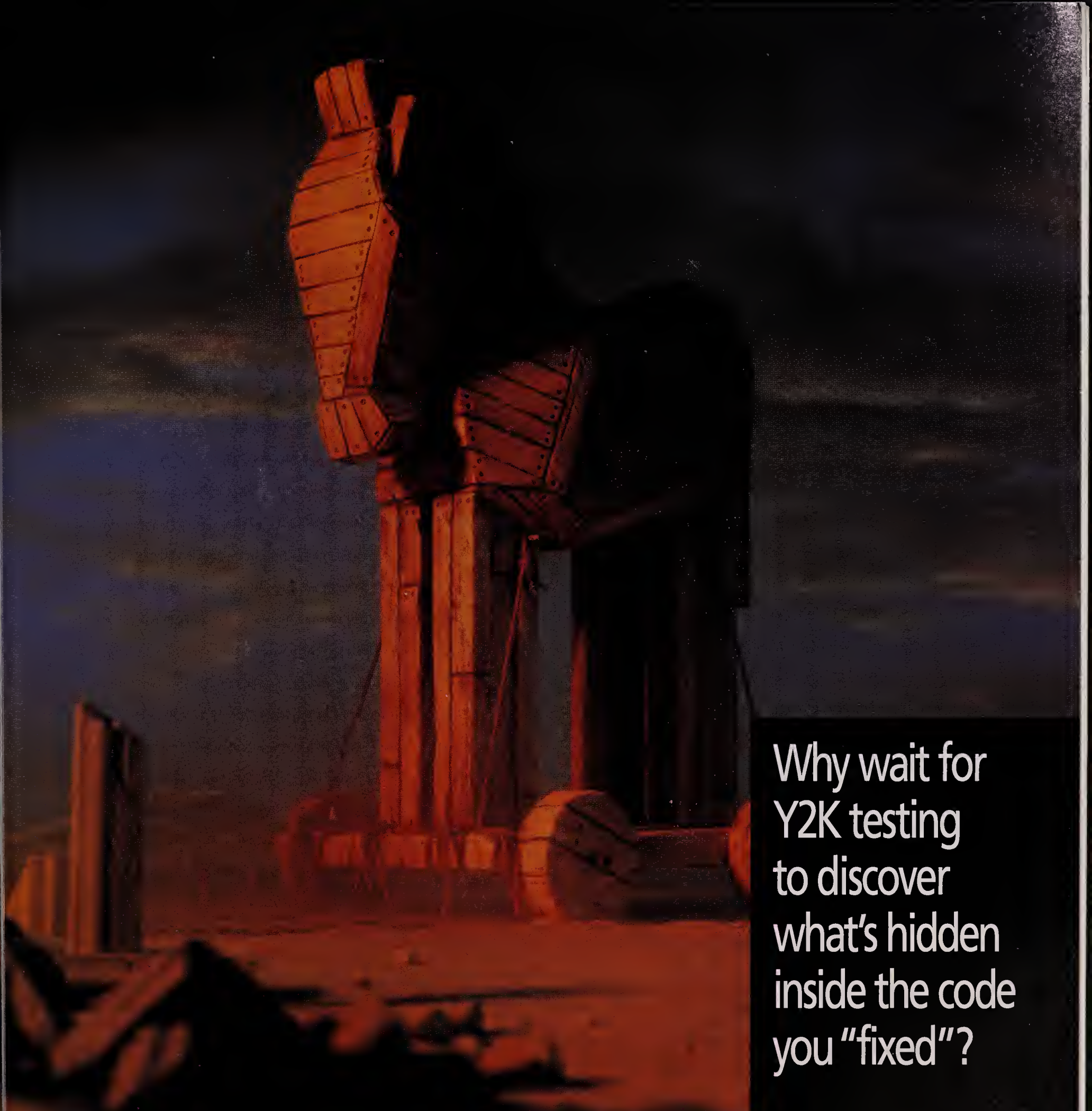
Major Application Migration: For most organizations, the focus for this phase is on moving nonstandard production systems such as enterprise software packages, DBMSs and systems development tools to standard ones. The costs of this phase are the highest and most situation-specific. However, in general, the cost components will include labor for management, development, support, training

Re-architecting: A Case Study

At a large financial institution, upfront costs brought long-term benefits

PHASE	COSTS	BENEFITS
1. Planning 6 months	\$100K 70% Internal labor 20% Consulting 10% Miscellaneous	Nonquantifiable Business case Inventory Team
2. Initial Migration 80% complete at 12 months	\$400K (80% Complete w/o hardware & software) 60% Internal labor 25% Consulting 15% Training tools	\$100K Purchases eliminated Volume discounts
3. Major Application Migration 60% complete at 18 months	\$3M (estimate for 60% completion) 60% Internal labor 20% Consulting 20% Other	\$500K 70% Labor 20% Hardware & software 10% Other
4. Post Migration Ongoing	\$100K Maintenance	\$5M Yearly

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Transactions in the Age of the Consumer

Giga View

and deployment. Expenses will also include hardware and software for servers, applications and networks as well as consulting fees because new skills are needed quickly.

In our case study company, quantification was difficult because it was impossible to separate expenses for architecture from expenses for year 2000 fixes. But during this phase, the company realized greater quantifiable benefits by consolidating servers and, because of added purchasing power with a single vendor, eliminating or reducing licenses and maintenance agreements. For example, fixing on Oracle as a standard eliminated the need for Informix but brought significant one-time development and deployment costs. The company also eliminated or reduced support costs for products being phased out. Nevertheless, the \$3 million migration costs of this phase greatly exceeded the benefits.

Phase 4

Post Migration: In this phase, costs are primarily labor-oriented, associated with maintaining the architecture when companies purchase consulting and/or advisory help to supplement internal expertise. Typically, with the job done, the benefits of Phase 4 dwarf those costs.

The benefits of Phase 3 expand during this phase: Hardware consolidation makes volume purchasing discounts possible; reductions in labor and technical support allow staff reductions because of a simplified infrastructure. The company can now use automated tools for network monitoring, software distribution, virus protection and other tasks made simple by standardization. In addition, having a simpler, more predictable technical infrastructure reduces the cost of developing new systems and the risk of new product deployments, development and daily troubleshooting. For example, at the financial company we studied, DBMS performance for the single Oracle Corp. data warehouse has become easier to anticipate because expertise is not needed for systems that no longer exist at that company—Microsoft's SQL Server, IBM's DB2 and Sybase Inc.'s Adaptive Server. Other cost benefits are realized because of faster tool selection, reuse of software mod-

ules, data interoperability, best practices knowledge databases, tighter network security and simpler administration of systems. An additional expected benefit is reduced employee turnover because of greater application of cross-training. With fewer systems to manage, more people are available to cross-train

others from redeploying key employees. Since most IS people have multiple responsibilities, work assignments must be clustered around the people who will remain, and their job descriptions and incentives must be rewritten to reflect their new responsibilities.

■ Implement "quick hits" and promote

The perceived value of a service diminishes exponentially after the service is rendered.

on those systems. Training on new systems is for many IT workers a strong incentive to keep their résumés in the desk drawers rather than in the mail.

OF COURSE, THE PHASES AND corresponding benefits will not necessarily be identical for all companies that overhaul their enterprise IT architectures. However, most companies can apply a mixture of the following tactical and strategic recommendations:

■ Combine technical and financial planning. Project funding decisions cannot be made without considering the effect on the enterprise architecture. People involved in the development and maintenance of an architecture must also be involved in financial planning.

■ Be opportunistic. Year 2000 urgency, for example, should be exploited to persuade other executives to implement an enterprisewide IT architecture initiative. Centralizing purchasing as a point of control is another selling point for establishing an architectural initiative.

■ Establish baselines. An assessment of an IS organization should emphasize components that can be objectively measured because performance metrics provide both a focus for IS management attention as well as a report card for the organization at large. There is an axiom that the perceived value of a service diminishes exponentially after the service is rendered. That phenomenon can derail any initiative.

■ Reorganize the work and the people to save money. The simplification that comes with standards will reduce the amount of necessary labor. Some savings will come from eliminating jobs,

the long-term benefits of the project. A business case should include whatever near-term benefits can be realized. Great effort should be made in reaching these goals, which should then be publicized as hard evidence that the business case is valid.

The leader of an enterprise IT architecture initiative should be a facilitator, an evangelist and a project manager. The CIO should be continually and visibly involved in every phase of the project, although once at Phase 4 smart managers will delegate regular maintenance responsibilities.

■ Use enterprise resource planning software (ERP) and other products as infrastructure building blocks. ERP products such as SAP and building blocks such as the Involv Host platform from Changepoint Corp. provide packaged functionality that implements standard processes and tools as part of their deployment.

Client/server, reengineering, the Web and other technologies or IT initiatives have dramatically increased the number of components that IS must support. Distributed organizational structures that arose out of the need to improve business alignment have made coordination and leverage nearly impossible. Finally, the industry's recent emphasis on measurement of costs, risk management and benefits of IS have unearthed the fact that IS has a larger influence on the bottom line than previously believed. **CIO**

Marc Cecere is director of IT management at Giga Information Group Inc. He can be reached at 617 577-4743 or mcecere@gigaweb.com.

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Good uses of a data warehouse can mean the difference between staying in business or Chapter 11

BY DAVID PEARSON

Marketing for SURVIVAL

HALF A CENTURY AGO, Manny Fingerhut was making and selling protective seat covers for automobiles in a small garage in Minneapolis when a tie catalog arrived in the mail. Getting the catalog suggested new ways to Manny to attract customers to his own business. An idea formed. Recognizing that his products sold best to folks who had just bought a new car, he rented a list of auto registrations and mailed a modest advertising circular to the people on the list. Within four years, he had converted his business strictly to a mail order channel—a move that allowed him to expand business well beyond his immediate

area—and annual sales were approaching \$1 million.

Today, Fingerhut Corp., which is headquartered in Minnetonka, Minn., is a \$2 billion business whose survival depends on its enormous data warehouse, 50 years in the making. “We’ve never done business without some form of database marketing,” says Andy Johnson, senior vice president of market development. “It’s the heart and soul of this company, and we wouldn’t be in business without it.”

Reader ROI

YOUR COMPANY’S GREAT PRODUCT will not reach its target market unless a comprehensive data warehouse reaches out to the hearts and minds of your most desirable customers. From this article, learn to

- ▶ Equip marketing departments with the information they need
- ▶ Educate and motivate creative marketing minds to use data mining tools
- ▶ Provide in-house customers access to complex, ever-growing data warehouses

Johnson's group, split between roughly 200 market analysts, 300 creatives (who write, design and produce the catalogs) and 40 statistical scientists, looks to the database for the insights that help the company differentiate itself from competitors. Fingerhut marketing uses several hundred intricate, proprietary mathematical formulas to segment markets into niches and to make decisions on everything, such as product pricing and creative copywriting in product descriptions.

Most businesses that venture into database marketing do so to sell to myriad customers one at a time. Fingerhut's success in pulling this off—sales have grown steadily since the late '80s, surging 23 percent in 1995—is the result of a concerted effort to turn marketing into a group of tech-savvy power users.

That's where Fingerhut's IT shop comes in. Of the division's 550 members, 16 are dedicated to the data warehouse, and they're as much a training operation as a technical one, according to Tom Bozlinski, senior vice president of operations and network services. By helping marketing grow in its comfort and sophistication with the technology, Bozlinski's division makes a direct and conspicuous contribution to the company's bottom line: The faster marketers can identify significant new niches in demographics and nuances in behavior, the faster Fingerhut can reach customers with the right offerings at the right time.

Data Warehouse Uses

If you've bought an item or two through the mail, especially items Fingerhut sells—anything from slippers to stereos to swing sets—the company probably understands your spending habits better than you do. Its aim is to place all its own customers and those it

<http://www.cio.com>



Andy Johnson, senior vice president of market development, cooks up 40 percent more orders with customized catalogs, while Tom Bozlinski (below) dedicates 16 members of his network service team to his data warehouse for a slam-dunk on technical and training support.



COMPANY PROFILE: FINGERHUT

learns about by buying information from other mail-order houses into groups large enough to justify print, production and mailing costs. Since every member of the group interacts with direct marketing in the same way, Fingerhut can tailor its efforts to increase business with that group as a whole. Data mining helps Fingerhut compete with store-based competitors.

For example, Fingerhut marketing recently found that customers who change their residence triple their purchasing in the 12 weeks after their move, with a peak in buying the first four weeks. Their selections follow a pattern—they go for furniture, telecommunications equipment and decorations but stay away from jewelry and home electronics. Not a revolutionary finding, but a key one to Fingerhut. The company used the discovery not only to tailor a new “mover’s catalog” to entice customers who moved but to save money by not sending certain other catalogs during that 12-week window.

The lesson? If a customer subset exists, no matter how geographically dispersed it may be, marketing needs to ferret it out.

Customer Service

Like an insurance company, Fingerhut depends on actuarial tables that forecast probabilities, behaviors and statistical cer-

Fingerhut at a Glance

Type of Company: Catalog retail

Headquarters: Minnetonka, Minn.

Employees: 9,500 in five states

Revenues: \$2 billion (1996)

Revenue Growth: Steady since 1982, with a peak in 1995 at 23 percent

Customer Base: 71 million people have made at least one purchase

Products: 15,000 items in categories such as housewares, electronics, exercise equipment and outerwear

Catalogs Mailed: Mailings for 1997 were 467 million

Data Warehouse Power: The 7-terabyte database can crunch up to 2,000 variables about a single customer

tainties. Fingerhut uses the customer intelligence that arises from its warehouse to blend marketing with customer service. Order something through the mail, and you’ll be phoned by a customer service rep, who will confirm your order and let you know when you can expect it at your doorstep. The rep will also ask your permission to be contacted in the future for feedback on merchandise or service. Decline the offer, and you won’t be called again. Such small steps amount to highly personalized service, and that in turn fuels customer retention—a critical factor in an industry where the costs of acquiring a customer aren’t typically recovered until after a number of transactions.

To get to the information that drives such tailored sales and service, Fingerhut marketers primarily use point-and-click GUI software from both Software AG Americas Inc. and SAS Institute Inc. Plans call for the company to move its data warehouse from an Oracle relational database management system in

a Sun environment to an IBM Corp. SP multiprocessor supercomputer running IBM’s DB2. Basic queries, such as the names of all customers who purchased a particular product from a particular catalog, are available as frequently asked questions (FAQs). To perform more detailed segmentations or test new hypotheses, users formulate ad hoc mining queries that may combine many disparate variables.

Johnson points to a recent data analysis in which a marketing staffer discovered that a geographically dispersed subset of customers who responded more robustly to direct marketing offers in Spanish had also demonstrated a particular penchant for jewelry. Accordingly, the company created and sent those individuals a Spanish-language catalog with a decided accent on fine jewelry (it offered a product mix heavier on the jewelry than the standard catalog that went to most other customers in that mailing).

“This may seem simple, but it took a lot of querying and a lot of weeding out to arrive at the final mailing list for that catalog,” says Johnson. And the result: The catalog regularly generates about 40 percent more orders than would normally be expected from those customers, according to Johnson.

School Days

A lot of innovative training brings that kind of success, month after month, says Bozlinski. His group developed two methods to unveil the mysteries of the data warehouse to marketing and continues to develop training methods to suit systems upgrades.

Jane Schroeder runs classes that can train as many as 100 people on how to sift the sands of a data warehouse.





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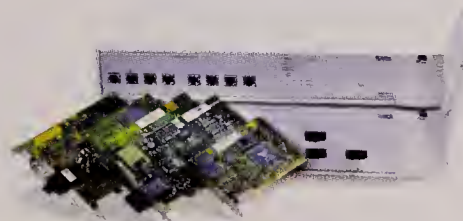
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COMPANY PROFILE: FINGERHUT

The first method has been standardized and turned over to HR as part of its regular educational curriculum. The training is general and voluntary—although marketing sends all new hires to it, according to Jane Schroeder, manager of IS's 16-person data warehouse group. Often, the sessions, each of which draws close to 100 participants, are more like discussion forums, pep rallies and game shows than they are classes.

"We try to keep it light and fun," says Martin Beukhof, director of systems development, who describes a recent session at which marketing users split into two teams and competed in a Q-and-A showdown, à la Jeopardy, for a group lunch. "The idea is to get people sharing tips and challenging each other to come up with new ways to get more out of the data warehouse," adds Beukhof. "Usually members of senior management are present to report success stories and pump up the group. [Senior management] really believes in it—they want people just pounding that data." The second sort of training is low key and reserved for advanced users. In formal sessions conducted by Schroeder's group, no more than six students at a time report to a classroom equipped with workstations and full access to the database. They're encouraged to bring real queries and analyses they've been working on and to share them with the other members of the class. Sessions are held for a half-day once a month; follow-up questions are funneled through the regular IT help desk to a member of Schroeder's staff. Costs for running the class come out of the operating budgets of the departments that send students.

Class discussions often focus on such issues as how to formulate efficient queries that produce usable results. If, for example, a user is testing a gut feeling about a possible connection between rural addresses and hammocks to isolate a subset of leisure-product customers who may be interested in a seasonal catalog, he's encouraged to go beyond asking for average sales of hammocks in the summer in rural versus urban areas. "We remind them to look for the total number of customers who've purchased particular items and some other statistics that can really change the hypothesis," explains Schroeder.

Fingerhut guards against wild misinterpretations of data by testing new marketing ideas on advance groups of at least several thousand individuals, says Bozliniski. For instance, before the company offers a trendy new piece of exercise equipment in a catalog, it might first see how 10 groups of 10,000 respond to it against other comparably priced devices in special, home-fitness mailings. Meanwhile, IS mon-

itors user queries, both manually and by regularly running resource-monitoring tools that find frequently repeated or closely similar data warehouse queries that could be turned into "canned" queries or FAQs.

"Training never dies, and it's always changing," says Bozliniski. Bozliniski solicits feedback from finance, telesales, shipping and HR as well as marketing. "If people feel there's a training deficiency, I'm going to hear about it fairly quickly," he says.

It isn't very likely that Manny Fingerhut envisioned his seat-cover operation evolving into a virtual superstore—particularly one dependent on high-technology to understand its customers. "This company has focused on refining [Manny Fingerhut's] brilliantly simplistic insight to precisely target the audiences that might want your products," says Johnson. "Today it appears he was way ahead of his time: That's the only way to survive in this industry." **CIO**

Senior Writer David Pearson can be reached at dpearson@cio.com.



Martin Beukhof knows senior management "wants people pounding that data."

Data (Ware)Housekeeping

Maintaining a massive data warehouse for use by an aggressive marketing department means paying vigilant attention to three activities

- 1 Data updating.** Operational users need to know the up-to-the-second status of one particular customer's order, and they need that information on demand if the customer is on hold. So data additions, deletions and modifications need to be done at separate times.
- 2 Performance tuning.** Data should be stored and structured within a database to allow fast and easy use by decision-support users such as marketing researchers. That requires continual fine-tuning.
- 3 Speaking the same language.** A word like "order" might mean one thing to marketing and another to the people on the loading dock. Head off the obvious frustrations that can result while accessing the data warehouse.

—D. Pearson

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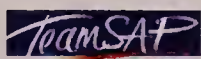
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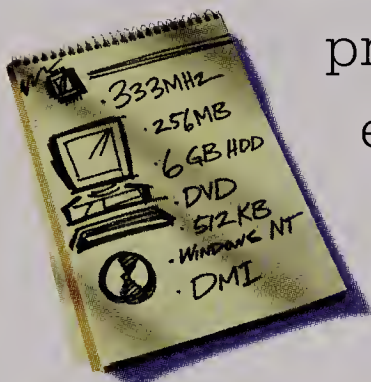
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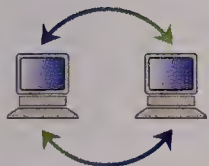
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EXPORT A HEADACHE



Will handing a stranger the keys to the company network keep you awake at night?

BY TOM FIELD

TEXTRON INC. IS FLYING HIGH. In 1997 the Providence, R.I.-based manufacturer of Bell helicopters and Cessna aircraft invested roughly \$1 billion to acquire 12 market-leading businesses worldwide and boosted its offshore profits to an eye-popping 39 percent of the company's \$10.5 billion total revenues.

To support this heady growth, nothing is more critical than an effective communications network. At Textron, data, voice and video networks that connect headquarters to business units and business units to partners form the strategic link in the company's manufacturing and sales chains. As this network grows, diverse platforms are unified, and peak performance is monitored and maintained. As do other global manufacturing companies, Textron seeks new network technologies to ensure the company's capability for global electronic commerce.

Yet, rather than keep key network operations within the internal IS organization, Textron has contracted with another company to run its networks. In September 1996 the company signed a 10-year, \$1.1 billion network outsourcing deal with Florham Park, N.J.-based AT&T Solutions.

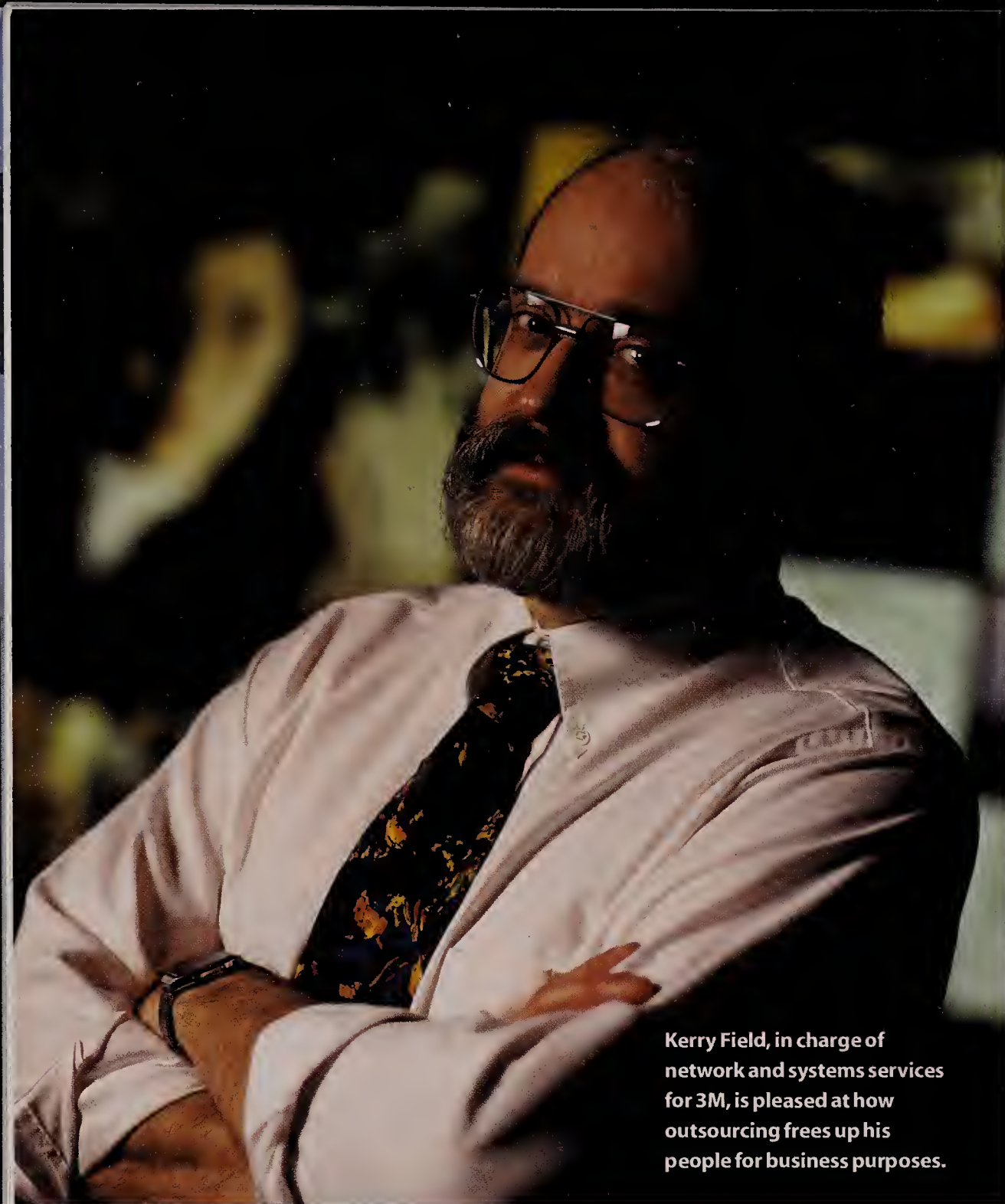


Reader ROI

NETWORK OUTSOURCING IS A NEW AND rapidly growing market trend, but you need to know the fine points in order to decide if it is the right strategy for your company. From this feature, learn

- ▶ Why companies seek external help with voice, data and video networks
- ▶ How outsourcing can help alleviate your IS staffing crisis
- ▶ The challenges of managing an outsourcing relationship
- ▶ How to maintain management and staffing continuity
- ▶ How network outsourcing can improve service and save money

William Gauld, Textron's CIO, saved 11 percent on network operations by outsourcing.



Kerry Field, in charge of network and systems services for 3M, is pleased at how outsourcing frees up his people for business purposes.

Why outsource? Textron's personnel certainly have the skills to do the job, but executives had feared network management might become the IS department's only job, sapping necessary staff and resources from more strategic, business-driven projects. The company was also looking for the kind of global telecom capability that would support its strategy of international acquisitions. William Gauld, Textron's CIO and vice president of corporate information management, says there was no question that Textron's top-notch people could supply a top-notch network, but "trying to staff up internally to match our needs—that didn't work for us."

Since signing its deal with Textron, AT&T Solutions has begun rolling most of Textron's individual information networks into a single, standard architecture. Going into the deal, Textron executives didn't even know what they spent on network support, Gauld says. Now he knows exactly what the network costs, and with access to

AT&T Solutions' advanced technologies, Textron's network is evolving to keep pace with the company's global growth. As Gauld had expected, network operations costs are down by 11 percent, a savings he expects will continue. "We're moving toward a common telecommunications infrastructure around the world," Gauld says, "and we're starting to leverage synergies between businesses and vendors." In other words, IS is free to concentrate on its main job of developing new applications to support Textron's business growth.

Textron is but one of scores of companies across all industries now testing the waters of network outsourcing. From a market of none, the practice over the last five years has become one of the fastest-growing segments of the IT outsourcing industry. Since 1996 the demand for LAN and WAN services, both in-house and outsourced, has grown from what Forrester Research Inc., a Cambridge, Mass., market

research firm, estimates as a \$17.5 billion worldwide business to one that by 2002 will top \$65 billion. Over this same period, International Data Corp. (IDC), the Framingham, Mass.-based market research arm of International Data Group, CIO's parent company, projects the network operations outsourcing market will expand by 17 percent annually. Filling this market space is a growing pool of providers ranging from major telecom vendors such as AT&T Corp. to traditional IT vendors such as IBM Corp. and Unisys Corp. (see "Rate the Players," Page 60).

A NEW MARKETPLACE

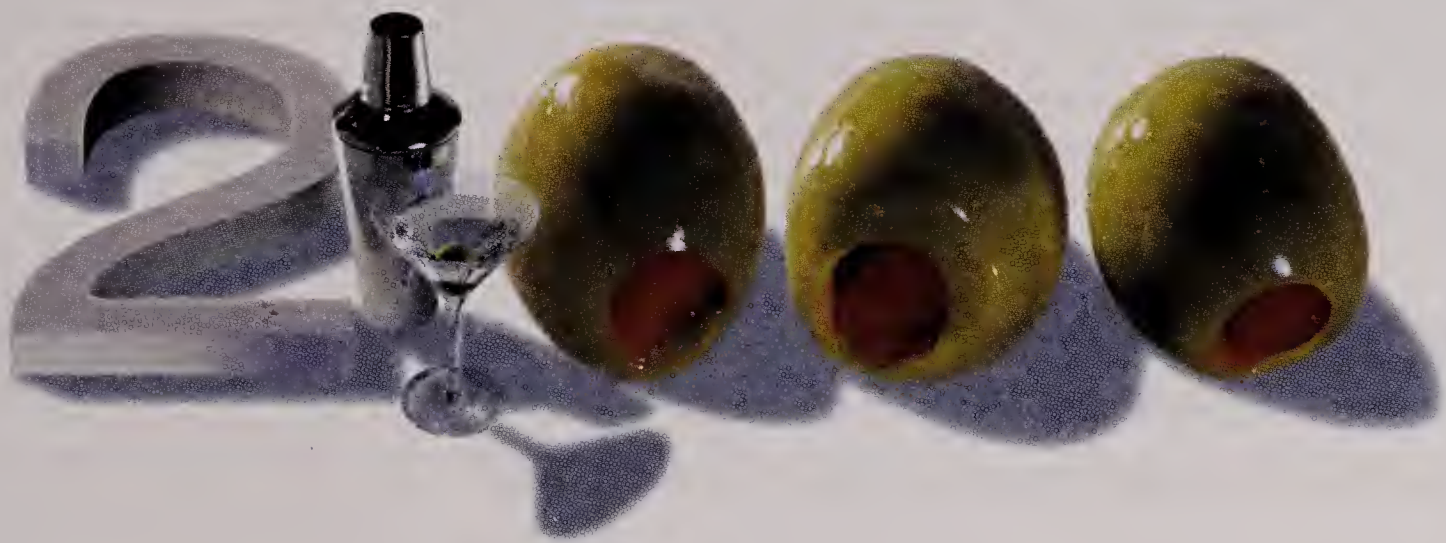
Alexandra Whitehead, vice president of service lines for G2R Inc., a Mountain View, Calif.-based applied market research and consulting company, has conducted in-depth interviews with nearly 100 end users worldwide about the benefits they expect from having outsourced their networks (see "Network Outsourcing Deals," Page 56). This group of companies anticipated cost reductions of anywhere from 10 to 20 percent over the life of their network outsourcing contracts. But Whitehead is also quick to confirm Gauld's objectives as typical of the objectives expressed by the users she interviewed. "Companies don't outsource primarily to save costs; that's not what [network outsourcing] is about." Instead, she says, prospective customers are looking for increased network availability, reduced response times and greater customer satisfaction (both internal and external)—results that can boost competitive advantage for businesses that rely on speedy, reliable information flow. And companies that have outsourced their networks say they are seeing those benefits as a result, as well as experiencing significant advantages in staffing and in aligning IS with business goals.

STAFFING

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COVER STORY: NETWORK MANAGEMENT

market that is already struggling to match supply with demand (see our special issue "Help Wanted Now," *CIO*, Dec. 15, 1997/Jan. 1, 1998), network professionals are among the toughest to recruit and retain. And the reality is that if the network is stable and running right—when no new technologies or extensions are being added—it doesn't require a lot of maintenance. Companies that keep network operations in-house may find themselves paying premium salaries to people whose best work is needed only sporadically, at times of crisis.

For these reasons—the pressure to learn new skills, the IS staff's distraction from strategic business goals and the expense of maintaining an IS crew that

develop the MinneVAN (Minnesota's Value Added Network), a private, IP-based frame relay network that can link corporate headquarters with just over 30 non-3M sites—contract suppliers, universities, distributors and third-party manufacturers. Outsourcing network concerns has allowed 3M's IS organization to go after new business.

For example, when a Boston-based company needed to transfer the time-sensitive financial data that it compiles and sells from computer disk to CD-ROMs, MinneVAN helped 3M win the contract. NCR demonstrated that it could connect the Boston company to the MinneVAN, thus enabling a high-speed electronic data transfer between Boston

Such capabilities give 3M a significant competitive advantage, says Kerry Field, 3M's advanced specialist in charge of network support and systems services. And 3M's internal IS organization could not manage the MinneVAN alone, Field says. "It would really stretch our internal resources." With NCR supporting MinneVAN, "The [network supplier] can do the grunt work, so to speak, and keep the client happy, which frees us to do a lot of other things" that support 3M's core business processes, says Field.

Companies that keep network operations in-house may find themselves paying premium salaries to people whose best work is needed only sporadically, at times of crisis.

seems invisible when things are working well—many companies are reaching Textron's conclusion to outsource. "It's a competitive refocus [of IS resources]," says IDC Senior Analyst Richard Brewer. "These companies have decided they can't afford to have their internal people monitoring networks on a 24/7 basis. And they've found in some cases that it's actually cheaper to have an outside vendor manage their networks than it is to hire, obtain and retain these skills internally."

FREE TO ALIGN

Satisfying the service expectations of its partner companies was 3M Corp.'s objective in 1994 when the St. Paul, Minn.-based manufacturer outsourced a new external vendor access network to NCR Corp. in Dayton, Ohio. As at Textron, 3M's senior executives wanted to turn over the development and maintenance to an outside vendor so that the company's small IS organization could concentrate on maintaining 3M's approximately 135 WANs connecting remote 3M sites across the United States.

After signing on, NCR helped 3M

and 3M's CD-ROM plant. Since no tapes needed to be shipped, the data transfer could be completed in hours, not days.

SEEKING UPTIME

Keeping the system operating at full capacity is the goal of outsourcing the network at Caliber Learning Network Inc., a Columbia, Md.-based distance learning company. From the start of business in 1997, Caliber outsourced its complete network operations to Atlanta-based MCI Systemhouse. Although MCI Systemhouse's parent company, MCI Communications Corp., owns 19 percent of Caliber, network outsourcing was never mandated as part of the busi-

Network Outsourcing Deals

Nailing down the common success points of an outsourcing deal can save big bucks

In 1997 G2R Inc., an applied market research and consulting firm in Mountain View, Calif., asked 91 end user companies worldwide from all industry sectors, typically with 50,000 to 130,000 online workers each, to identify the current trends in network outsourcing deals. The following list comprises those trends.

- CIOs in the survey advise their peers:
 - Don't outsource just to save costs.
 - Make sure your company's culture can live with handing over control of the network.
 - Contact experts such as outsourcing consultants for help in understanding vendors' capabilities.
 - Make sure the contract specifies detailed service-level agreements,

the skill level of staff to be assigned and the labor rates for each level.

- Deals are priced according to the number of desktops, per addressable device or per user/per month.
- Contracts last from 2 to 10 years—most commonly 3 to 5.
- Deals are generally priced at \$1 million to \$2 million per year.

—T. Field

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COVER STORY: NETWORK MANAGEMENT

ness arrangement. In fact, MCI Systemhouse won the four-year, \$13.7 million deal on a level playing field after competitive bidding.

Caliber President Chris Nguyen's previous experience at Sylvan Learning Systems Inc. had been, well, a learning experience. Building and maintaining networks to learning centers in remote locations worldwide is "a huge, huge headache," says Nguyen. In this new venture he didn't want his internal IS organization to bear the pain of continually extending and fixing the network at remote learning centers, two persistent problems when Nguyen was at Sylvan. "I want our people focused on things that build the business, not on things other people can do for us," Nguyen says.

MCI Systemhouse plays a key role in installing networks at the company's first 40 learning centers in various U.S. cities. And so far, Nguyen says, the vendor has performed faster and at least at the same cost as Caliber could have accomplished internally. Ultimately, though, cost savings is a distant second behind Nguyen's top priority: uptime, which is measurably better than Caliber could provide internally. "If the network goes down, we don't make money," Nguyen says. "So if the uptime of our network is even just a couple of percentage points higher [because of the vendor's resources]," Nguyen says, "then there's just no question: Network outsourcing works."

THE CHALLENGES

Third-party network management is fraught with the typical outsourcing cautions: Understand your costs and services before you outsource, choose your vendor carefully and negotiate a flexible contract. But there are also some other challenges that with network outsourcing are harder than ever.

The internal sell can be tough. Sure, that challenge seems to be part of every IS project, but when it comes to the network, people get suspicious. How does one convince the boss—and other key decision makers—that it makes good business sense to put an outside vendor in charge of key network operations? When Textron's Gauld confronted this dilemma, he

showed his executive team that the cost of maintaining network operations and staff internally was variable and greater than the fixed cost of contracting with AT&T. Gauld met with the internal customers who rely on Textron's network, and he explained his gut feelings. "I told them, 'I don't see in any of your business plans where you intend for your factories to be more standalone or where you expect to have less communication with your customers and business partners,'" Gauld says. "I told them, 'I can't tell you exactly what you'll do with [the enhanced network] yet, but I do know you want to communicate more with your customers and your partners.'"

Gauld's internal customers could not disagree. Subsequently, they have experienced greater network uptime and connectivity to their customers and partners as a result of the outsourced services.

Security concerns must be addressed. Many users fear that their private data will be poached by hackers who break into the vendors' network operations centers (NOCs) or that information will somehow be passed along to competitors whose networks are managed by the same vendors. To alleviate this fear, vendors often go out of their way to fortify their NOCs. Nine months ago, Unisys Corp., a Blue Bell, Pa.-based vendor, built a network "command center"

When the Going Gets Tough, the Tough Outsource

It's not your imagination. There really are reasons IT life is getting more and more complicated.

Network outsourcing's rising popularity as a business tactic is tied directly to the network's evolution as a strategic business asset. As companies have transferred business processes such as sales and service to data, voice and video networks, and as LANs and WANs have given way to intranets and extranets, network technologies have become crucial to business strategies. As IDC Senior Analyst Richard Brewer says of today's business environment, "Find me a network that's *not* critical to a business."

But these essential networks are also more complicated to manage because technology never leaves the network. Newer technologies are add-ons; they rarely displace older technologies. For example, as Internet connections are added to traditional telecommunication methods such as telephone and elec-

tronic data interchange (EDI), network support staff must master more skills associated with building, monitoring and maintaining complex networks.

Julie Horkan Meringer, a Forrester Research Inc. senior analyst, categorizes those skills in three groups in her August 1997 computing strategies report "Network Help Delivers."

- Experience with advanced IP networking in order to migrate companies' voice/video/data networks to Internet delivery systems.

- Expertise in Internet computing management to monitor and maintain applications that leave the corporate system via Internet/extranet connections.

- Knowledge of distributed security, which is the ability to open firewalls and master the highest levels of encryption and data protection.

—T. Field

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Rate the Players

Forrester Research Inc. interviewed information execs and network providers to grade network outsourcing services

The Top 10 Network Outsourcing Providers	IP migration	Internet computing management	Distributed security	Global reach	Service and support	Vision
IBM Global Services	5	3	3	5	4	4
AT&T Solutions	3	3	2	5	4	4
BT/MCI*	4	3	2	5	2	3
Unisys Corp.	3	3	2	4	3	4
Hewlett-Packard Co.	4	3	3	3	3	3
Wang Laboratories Inc.	3	2	3	4	3	3
Computer Sciences Corp.	4	2	2	4	3	3
Sun Microsystems Inc.	3	2	3	3	4	3
EDS Corp.	4	3	2	4	2	2
Sprint Corp.	4	2	2	4	2	3

1= Poor 2= Fair 3= Good 4= Very Good 5= Excellent

* THIS ENTITY NO LONGER EXISTS AS BT/MCI
SOURCE: FORRESTER RESEARCH INC., AUGUST 1997

that is protected by a full-time security officer to guard against physical break-ins, a state-of-the-art computer and network security systems. But the best way to alleviate people's security concerns, says IDC's Brewer, is to show positive results. Dozens of major network outsourcing deals are ongoing, and no customers are crying foul that their systems are being breached. "Most companies see the benefits [of network outsourcing] in terms of operational and budgetary advantages," says Brewer. "They're more concerned with those results than with the fear that [a vendor] will run away with their proprietary data."

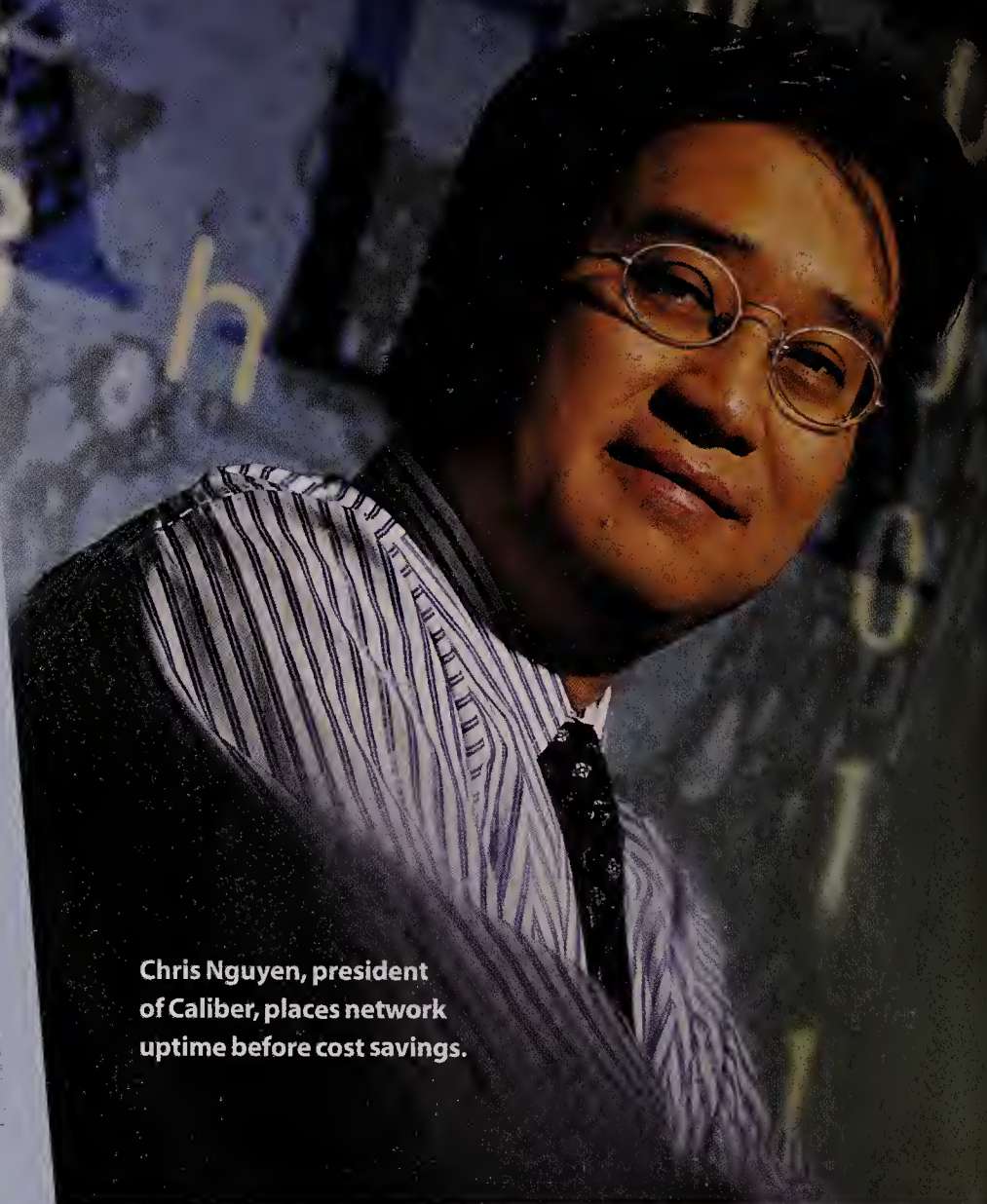
Ongoing management is a challenge once the deal is signed. Unlike many traditional outsourcing deals, where the vendor acquires the customer's equipment and staff,

network outsourcing tends to be more of a partnership; the customer keeps its equipment and some staff, which the vendor then augments with its own resources. But a difficulty arose at Caliber. "It's a turf issue," Nguyen says. "It's almost like this is [MCI Systemhouse's] network, not just our network, and our tech people don't like it," Nguyen says. To ease the strain, he reminds his staff that Caliber pays MCI Systemhouse a lot of money to keep the network online—and that this arrangement frees internal IS to concentrate more on application development. Yet, Nguyen, like many managers in network outsourcing relationships, has not found a permanent solution to this IS/vendor friction (see "Details, Details," Page 28).

Metrics questions can derail any network outsourcing deal. At Textron, network costs are reviewed

quarterly. The company plans to increase the frequency to once a month, but Gauld also inspects such data as response time to routine network requests and compares those results with AT&T Solutions' service-level agreements (SLAs). At 3M, Field does a monthly check of network management uptime, trouble tickets, installation schedules and other performance information that NCR stores for 3M on a MinneVAN Web site, but he cautions that network outsourcing should not be measured by data alone. "Ultimately, the end user decides," Field says. "I can't hide behind statistics that show response time is great when the user says it stinks or that my uptime is 99.8 percent when an outage prevents a customer order from being processed. The simplest [success indicator] is if my phone doesn't ring." **CIO**

Senior Writer Tom Field can be reached at tfield@cio.com.



Chris Nguyen, president of Caliber, places network uptime before cost savings.



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PREPARING
RESTAURANT INDUSTRY
FOR CHANGE

Come and Get IT

To edge out competitors for a healthier portion of the American food dollar, restaurants must cook up a fresh IT strategy

BY ALICE DRAGON

It's April 15, 2008. You've filed your taxes just under the wire and figure you deserve a night on the town. You and your family hop an electric cab to El Futuro, where the hostess greets you by name and guides you to your favorite table. As the server pours your usual—a San Pellegrino, three wedges of lime—you press a button and a touch-screen menu pops out of the table. After checking the fat content of the chocolate desserts and perusing the music menu, you order your food and choose your background music. Your children's pizza arrives with your appetizers, and by the time you're ready for your entree, the kids are off to play in the virtual reality room. After a peaceful repast and a decaf cappuccino, you request your online bill by recalling the menu screen, which

automatically pages your children on their VR headsets. You select a 15 percent tip, swipe your smart card through the reader, sign your approval with a digital pen and are ready to go just as your children return. Shortly after you leave the restaurant, the manager locks up and heads home, confident that the back-room computer will tally the day's inventory depletion, triggering automatic orders over the Web to suppliers that will replenish ingredients on delivery trucks in the morning.

Tomorrow's restaurants are determined to offer more personalized service and achieve supply chain efficiencies. And indeed, they must if they want to thrive in this increasingly

THUMB NAIL

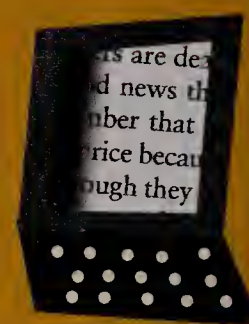
Industry: U.S. chain and independent restaurants

Primary Products: Prepared foods

Revenues: \$212 billion

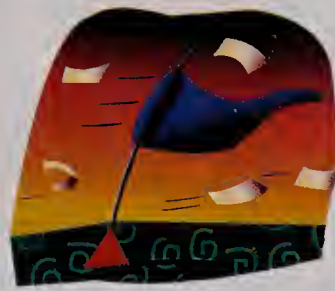
Number of Players: 377,050 units

SOURCE: TECHNOMIC INC., 1996



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FORCES OF CHANGE

Competition: Spurred by the expansion of chains, the number of U.S. commercial restaurant units is increasing by 5 percent annually, five times the rate of population growth.

Impact: Operators must provide more value and/or cut costs to maintain or increase market share. Efficient food-service response, a new supply chain optimization initiative, promises annual savings of at least \$14.3 billion among operators, distributors and manufacturers.

Labor Shortage: With national retail chains extending hours of operation and restaurant chains expanding, restaurateurs face a dwindling pool of low-wage laborers—and annual turnover rates of up to 300 percent.

Impact: Operators need to reduce training time and automate food preparation and service where possible.

Home Meal Replacement:

The demand for takeout, or what the industry calls home meal replacement, has increased more than 50 percent since 1984.

Impact: With takeout the most promising growth segment of food service, restaurateurs must address the needs of busy consumers—and fend off competition from grocers that have begun offering partially prepared meals.

competitive industry. Encouraged by Wall Street, aggressive expansion by national and regional chains is encroaching on niche territory once dominated by independent mom-and-pop operations. Of the \$212.3 billion in 1996 U.S. chain and independent restaurant sales, the top 100 restaurant companies accounted for 49.3 percent, according to Technomic Inc., a food industry market research company based in Chicago. Yet while the number of U.S. restaurant units has been growing 5 percent a year since 1994, U.S. population growth was just 1 percent between 1996 and 1997.

I.S. ACTIONS

IS executives in industries undergoing dramatic change can follow restaurant CIOs' coping recipes

Improve links between distributed units and headquarters.

Build extranets to facilitate low- or no-cost communication between restaurants and suppliers.



Integrate point-of-sale and operational systems so that sales data can inform labor scheduling and ordering decisions.

Incorporate just-in-time/just-enough training into systems so that servers can concentrate on waiting on customers.

Replace outdated proprietary systems (such as payroll and EIS) with Web-based systems.

Build data warehouses and promote data mining to get a better handle on customer demand.

"We all have to grab each other's market share rather than take advantage of ongoing growth," says Carl Dill, senior vice president of information services at McDonald's Corp. in Oak Brook, Ill.

In their quest to lure customers away from each other—and out to eat more often—restaurateurs must either reduce prices or add value to the food and services they provide. The missing ingredient that will allow restaurateurs to do just that is, of course, IT. "The food service industry is just waking up to how important IT can be," observes Jodie N. Ray, who, after 30 years at Texas Instruments recently became senior vice president and CIO of Dallas-based Brinker International, which owns such chains as Chili's Grill & Bar, Romano's Macaroni Grill and On The Border Mexican Cafe. Because food service is such a low-margin business—pre-tax income is generally 3.5 percent of total sales at full-service restaurants and 9.5 percent of total sales at fast-food chains—the industry has been slow to embrace technology. But the Internet's promise of low-cost communications is piquing the interest of both cash-strapped independent operators and large chains with hundreds—or thousands—of geographically dispersed units. And with IT costs falling and competition stiffening, restaurateurs are increasingly getting IT religion.

The \$14.3 Billion Opportunity

Since the invention of the blue-plate special, restaurateurs have known that lowering prices is the best way to attract consumers. Yet while bare-bones margins leave operators little room to cut prices single-handedly, Computer Sciences Corp. (CSC) in El Segundo, Calif., estimates that manufacturers, distributors and restaurant operators could save at least \$14.3 billion annually if they cooperated to streamline the notoriously inefficient food service supply chain.

Today, most restaurants' inventory replenishment systems are paper-based, error-prone and time-consuming. "Here we are in one of the most perishable businesses in the world and it takes two or three days or a week before suppliers know what we sold," says Honorio J. Padron, who recently left the food service industry after serving as CIO at Flagstar Companies Inc. and PepsiCo

Inc.'s restaurant division to become CIO of CompUSA. Padron speculates that 50 percent of the time, distributors' trucks are only half-full. The food service industry suffers, he says, because it's primarily run "by the gut."

But the days of relying on instinct to run restaurants are numbered. Industry leaders behind the fledgling efficient food-service response (EFR) initiative are publicizing CSC's \$14.3 billion figure to convince food service operators, distributors and manufacturers to optimize the supply chain. Whether passed on to consumers or invested in enhancing the experience of eating out, those savings are sure to stimulate more business.

IT will play a critical role in improving the flow of information and products through the food service supply chain. EFR's immediate goal—the industry-wide use of uniform product codes and readable bar codes—will simplify the process of capturing and sharing information electronically. The larger goal is to have sales data drive inventory replenishment in something close to real-time.

"The fact that some people still walk through the storeroom in the back of a restaurant with a notepad to generate orders for raw materials doesn't make a lot of sense," says Chuck Harrison, a principal in Ernst & Young LLP's consumer products industry group in Chicago. "You can go backward from the point of sale to calculate what raw materials went into the product and went out the door." Though some operators question the wisdom of taking managers completely out of the inventory loop, others are moving in that direction. At Domino's Pizza Inc. of Ann Arbor, Mich., "ideal" food quantities (for example, the chain's standard 36 slices of pepperoni per medium pizza) are automatically deducted from a store's inventory count every time an order is processed. At the end of the night, the system shows what should have been consumed based on what was sold and gives the manager an option to reorder; by year's end, 50 percent of Domino's outlets will be able to do so online. In 1999, Domino's plans to test having distribution center computers dial into stores to check inventory levels and sales forecasts and then generate appropriate orders automatically.

Other food service providers are turning to third parties to facilitate electronic



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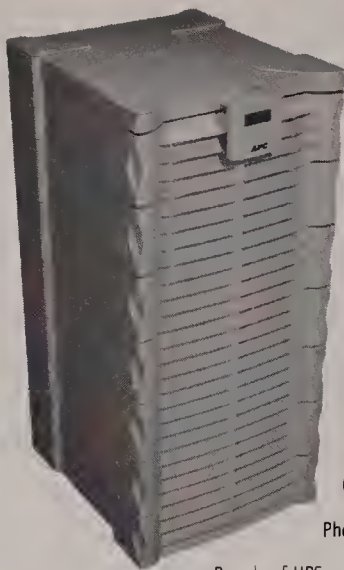
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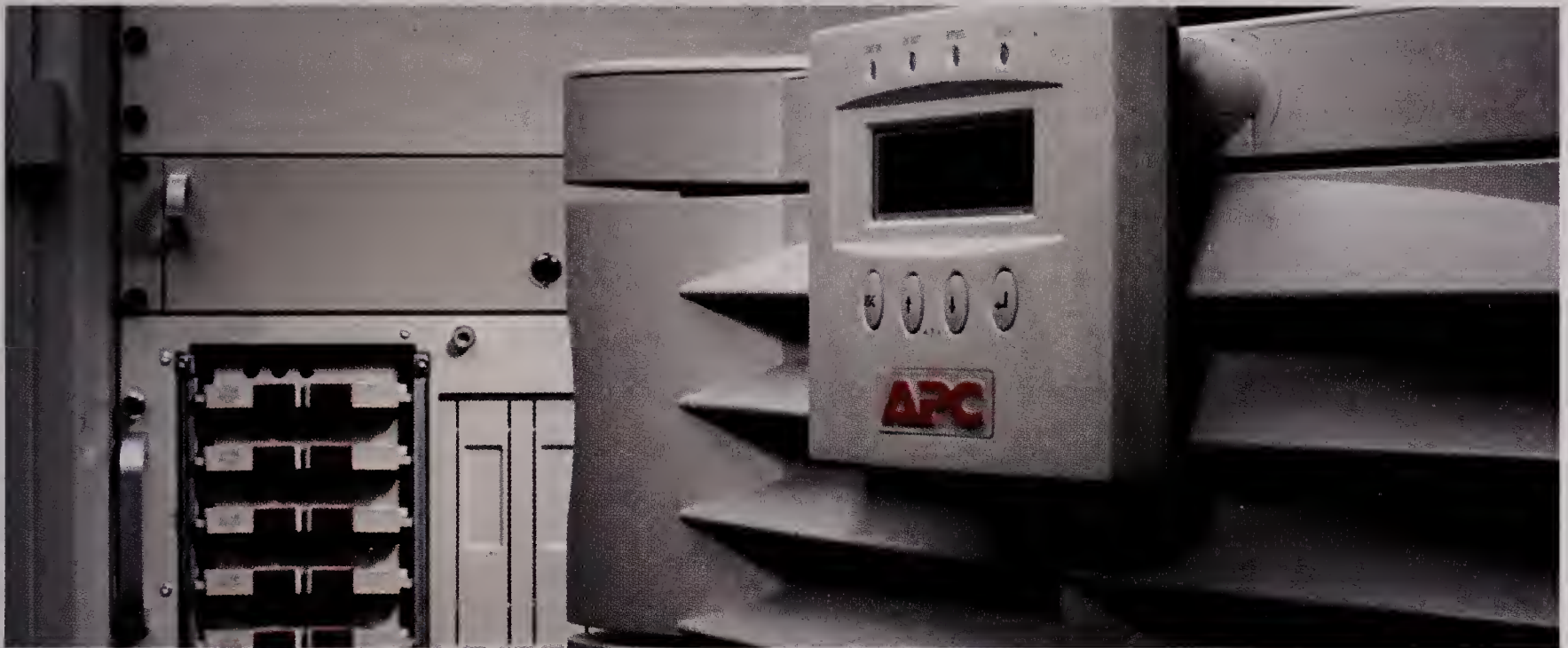
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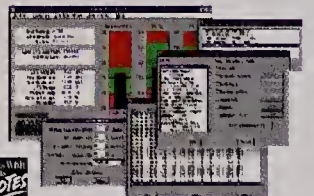
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PREPARING RESTAURANT INDUSTRY FOR CHANGE

ordering. Palo Alto, Calif.-based Instill Corp.'s e-store service lets restaurants set up customized online order forms that show their par levels, or the amount of inventory they always want to have on hand, and specify the vendors contracted to supply each item. When the restaurant manager enters the current quantity of each item in stock, e-store orders the difference between par and inventory, routing orders to the appropriate suppliers. Restaura Inc., a Phoenix-based operator of some 200 corporate dining facilities, reduced its inventory levels by 10 to 15 percent in the facilities in which it is testing e-store, according to Jim Fris, Restaura's purchasing manager. And because e-store is Web-enabled, Fris can monitor whether managers are complying with purchasing guidelines that let the company take advantage of volume discounts and rebates—and correct problems instantly

instead of wading through paper reports a month later; he says compliance improvements can save hundreds of thousands of dollars a year.

66 per person in 1997, according to the Chicago-based food division of research firm The NPD Group Inc. "The growth of two- and three-income families has

Grocery stores are scared to death. For the first time, in 1997, the amount of food consumed away from home exceeded the food consumed at home."

-CHUCK HARRISON

The Battle for Share of Stomach

Although cost-cutting measures help restaurateurs make their meals less expensive and thus more attractive to consumers, operators are also looking to earn customer loyalty by adding value to their offerings. Many operators are discovering that making their offerings more convenient increases their appeal to time-starved customers. Indeed, the number of takeout meals purchased at restaurants has soared from 43 per person in 1984 to

created a higher value of a minute, so to speak," explains Charles R. Troyer, a partner in CSC's national consumer goods and retail practice in New York City. "And consumers are more willing to outsource food preparation and service activities."

Smart restaurateurs are employing IT to take advantage of the growing demand for takeout. Domino's, for example, uses custom software from National Systems Corp. that uses caller ID technology to bring up the caller's name, address, phone number and most recent order on the point-of-sale (POS) terminal before an employee picks up the phone. POS screens can also indicate whether the customer qualifies for a coupon and employees can enter special delivery instructions, says Tim Monteith, senior vice president for IS and administration at Domino's. The system estimates a delivery time, then routes the order to a video screen in the kitchen that also tracks time elapsed since the order was placed. In addition to reducing errors and expediting pizza deliveries, the detailed order information lets Domino's target promotional mailings and fine-tune strategies for its national TV advertising.

Denver-based Boston Chicken Inc., the outfit credited with coining the term "home meal replacement" (HMR)—a snazzy synonym for takeout—has always viewed IT as strategic, requiring franchisees to adhere to company IT standards (see "Growing Pains," CIO, June 15, 1994). The company is now preparing to build on its takeout business by testing a line of ready-to-heat foods in Charlotte, N.C. A data warehouse under construction will help Boston Chicken determine the new line's impact on overall sales. (Are customers spending less on their entrees to afford a dessert, or are they willing to pay more to conclude their meal with a fresh fruit

RESTAURANT INDUSTRY AT A GLANCE

Past

Most restaurateurs have been slow to embrace IT, given low profit margins and the relatively high cost of technology. Those who could justify IT spending invested in proprietary solutions, such as point-of-sale and labor scheduling systems. Few restaurant chains had authority to mandate chainwide IT standards among franchisees, so technology vendors had no incentive to standardize. As a result, one of the world's largest fast-food chains wound up supporting 42 different point-of-sale systems. Manual, paper-based inventory management in restaurants coupled with adversarial relationships among restaurant operators, distributors and manufacturers resulted in inefficient ordering and inventory replenishment, driving up the cost of food and supplies.



Future

If food service supply chain partners recognize the benefit of sharing information to improve efficiency and cut costs, automatic inventory replenishment systems will replace manual processes.

Restaurant organizations will rely on intranets and extranets for low-cost communications between restaurants and corporate headquarters and to let restaurants order from current preferred suppliers over the Web. Wireless technology—and possibly smart cards—will improve table-side service. An industry move to open systems will pave the way for labor-saving ordering kiosks as well as the collection and mining of data that will help restaurants serve customers better. High-concept restaurants that offer entertainment and/or merchandise as well as food will prosper.



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start?) The Charlotte stores have also been outfitted with new checkout scanners that can read bar codes from five sides, an important advance for prepared foods that won't take kindly to being flipped upside down.

The Web may also help restaurants capitalize on the takeout trend. Last year, based on the success of its CyberSlice pizza-ordering Web site, a Seattle company called Cybermeals Inc. launched a Web-based ordering service for takeout food of all varieties. Geographic information system (GIS) software from GeoSystems Global Corp. directs surfers to menus from restaurants in their area that have signed up with the service and offer the kind of food they request; when they place an order, interactive voice response software calls the restaurant with the order, and the customer gets a confirmation e-mail with an estimated wait time. Domino's Monteith, however, notes that Domino's stores that have tried Web-based ordering through CyberSlice or other services generally get only one Web order per day. "It's all hype now in my view," he says. But Cybermeals claims the dollar value of pizza orders made through its CyberSlice site is 30 percent higher than the typical pizza takeout order.

Pizza parlors and traditional takeout operations aren't the only ones vying for the expanding takeout market. Grocers worried about losing out to HMR are introducing partially prepared, ready-to-heat and ready-to-eat meals that minimize the burden of cooking at home. "Grocery stores are scared to death," says Ernst & Young's Harrison. "For the first time, in 1997, the amount of food consumed away from home exceeded the food consumed at home. The battle for share of stomach is really fierce." Atlanta-based AFC Enterprises Inc., which owns Popeyes Chicken & Biscuits, Church's Fried Chicken and Chesapeake Bagel Bakery restaurants, is capitalizing on both the demand for takeout and grocers' eagerness to get in the HMR business by selling its Popeyes To Go line of ready-to-heat fried chicken through The Kroger Co.'s supermarkets. Kroger's bar-coded labels are affixed to the packages so that they can go through its checkout scanners.

The Labor Crunch

In a labor-intensive industry facing a shrinking labor pool, food-service CIOs are spending a lot of time cooking up plans to use IT to simplify training and improve worker efficiency. Not only are Baby Boomers well past the age when they're willing to flip burgers, but more and more retailers are shifting to 24/7 operations, intensifying the labor crunch. "At the entry-level end of the labor force, McDonald's wants that person, Wal-Mart wants that person, [as do] Walgreens, Barnes & Noble and Borders. Especially in the less-glamorous jobs in the back rooms and kitchens, [restaurants have] just got to make [operations] simpler and more efficient," says Harrison. Estimates of the average labor turnover in fast-food restaurants range from 116 percent to as much as 300 percent annually; to cover such expenses as training, uniforms and lost productivity, operators must spend \$1,000 to replace each entry-level employee and up to \$10,000 for a new unit manager. "In many cases in food service, the cost of turnover exceeds profitability," says George D. Williams, a Miami-based partner at Andersen Consulting.

Despite the relatively low turnover at Atlanta-based Chick-fil-A Inc., Vice President of IT and CIO Jon Bridges says the labor shortage is his company's biggest business challenge. In his quest to replace Chick-fil-A's old push-button registers, on which cashiers can require as much as two weeks of experience before they feel totally comfortable, Bridges is testing new touch-screen POS systems from the Hospitality Systems division of Radiant Systems Inc. in Alpharetta, Ga., and Par Microsystems Corp. in Norcross, Ga. "My daughter is 5, and she can ring up a sale on a touch screen with no training," says Bridges. In addition to being easy to use, touch screens can function as training tools themselves. Radiant's POS terminals can be programmed to offer multimedia training as needed; if a cashier's average sale is below \$4, for example, a two-minute video on so-called upselling would automatically play at the end of the shift. At AFC, which recently rolled out IBM 4695 POS touch terminals with FasFax software, managers can train

new cashiers in two hours instead of the six to eight hours needed for the old system. AFC's system also improves employees' salesmanship—and AFC's sales—because it encourages suggestive selling, prompting cashiers to suggest items that complement the customer's order, says Vice President and CIO Ed Brooks. "We can react to what the consumer is ordering and help the person behind the counter be more responsive," he says. "If you're buying a 12-piece chicken order, you probably don't want small sides."

Regal Cinemas Inc. of Knoxville, Tenn., has minimized its labor costs by employing kiosks instead of order takers at the four food counters in each of its five FunScape Entertainment Centers. Using kiosks from Radiant

Finding It Online

To find out more about change in the restaurant industry, visit www.cio.com/updates.

Systems' Entertainment division in Roswell, Ga., diners can place one order that includes food from one or more of a center's restaurants, such as Taco Bell, Pizza Hut and Arby's. The system divides the order, routing requests to workstations at the appropriate kitchen. Then an "expediter" assembles the order onto one tray and collects money if the customer hasn't already paid by credit card at the kiosk. Because one expediter can handle two lines, Regal Cinemas cut in half its labor costs for order taking. A kiosk is "the perfect salesperson," says J.E. Henry, vice president of MIS, who adds that "it's hard to train people behind the counter to always do suggestive selling."

Although almost all big chains and many independent restaurants recognize the strategic value of technology, IT's full potential is far from realized in the restaurant industry. Because most franchise operations haven't had the authority to mandate IT standards, uniform data collection has been next to impossible. But a move to open systems should resolve the standards issue eventually and pave the way to a more integrated future. And if more information about what customers want can be shared more efficiently both internally and with trading partners, El Futuro will be here before you know it. **CIO**

Senior Editor Alice Dragoon can be reached at adragoon@cio.com.



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Emerging Technology

THE STATE OF THE ART,
NEW PRODUCTS
AND STAYING AHEAD
OF THE CURVE

Edited by Howard Baldwin

From Sci-Fi to Security

*Biometrics move beyond
Star Trek into reality*

BY SARI KALIN

WHAT DO STAR TREK COMMANDER William T. Riker and Novell Inc. Chief Technology Officer Glenn Ricart have in common? When Ricart wants to enter his company's research lab, he holds a badge up to the door, speaks his password—"Authorization Ricart, Delta Five Two"—and the door opens. "I'm living out my *Star Trek* fantasy," says Ricart, former CIO at the University of Maryland, whose last name and password sound similar to those of the television character.

More than fantasy, Ricart is testing technology that some say could help safeguard corporate data: biometrics. Such systems can identify and verify workers based on unique physiological body parts or traits. Fingerprints, eyes, voice and signature are among the telltale characteristics. Novell's automatic doorkeeper, which is only a research project at this point, verifies Ricart's voice by matching it with a voice print residing on a network server to assure that Ricart is indeed Ricart before letting him in. Novell has yet to decide whether to incorporate speech verification into its products, Ricart says. But from little-known startups to established enterprise names, a growing number of vendors believe biometric technology could become part of the CIO's security arsenal.

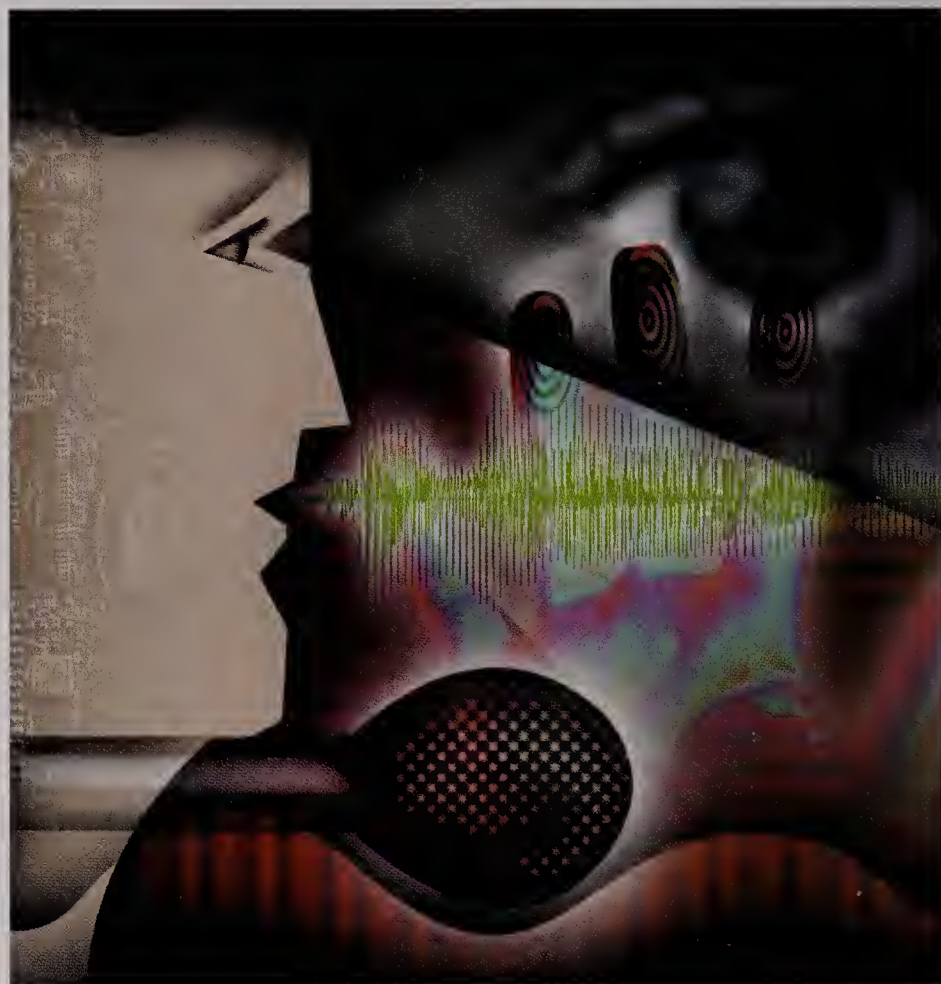
Trait-tracking technology is nothing new. Commercial biometric systems have been around for more than 20

years, analysts say, mostly for specialized applications such as controlling access to super-secure facilities and keeping tabs on workers' time on the job. More recent applications include identifying people at welfare offices and the 1996 Atlanta Olympics. Historically, high costs have been a barrier to broader deployment. But recently, analysts say, prices have dropped and shrink-

wrapped products have started to appear. At the same time, corporations' concerns about security in general and network access in particular have grown. Although the market is tiny and skeptics have concerns, some observers believe biometric systems are ready for wider deployment and that computer security is becoming a compelling application.

Someday My Prints Will Come

To understand why biometrics could catch on, examine the state of computer security at a typical company, says Jonathan Eunice, an analyst and IT adviser at Illuminata Inc. in Nashua, N.H. How do typical users remember their many passwords? They write them on sticky notes and post them near their keyboards, thwarting corporate security attempts. It remains to be seen whether biometrics will be a bigger hit with IT security managers than are smart cards, Eunice says. For users who are not particularly computer literate or security sensitive, he



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says, biometric systems may be more effective than smart cards because they are something you "are," not something you must remember to carry with you. Novell's Ricart, whose group is also evaluating smart cards' potential for network authentication, notes that most deployed PCs do not yet have smart card readers; in contrast, microphones and sound cards are common.

Currently, a CIO can find a head-spinning array of biometric systems on the market, sold by roughly 100 vendors, systems integrators and VARs, according to Erik Bowman, an analyst at CardTech/SecureTech Inc. in Bethesda, Md. Devices that recognize fingerprints, hand shapes, faces, eyes (iris or retina), voices and signatures are available, he says. A product that can identify users by their keystrokes is also being developed.

Each technology has pros and cons when evaluated for price, accuracy, intrusiveness and ease of use, says Samir Nanavati, a partner at International Biometric Group LLC, a New York City-based consulting firm. Fingerprint readers, for example, can be purchased for just a few hundred dollars. The devices, which work as PC peripherals, are roughly the size of a mouse. Depending on the manufacturer, they can connect through a parallel port, serial port or universal serial bus, he says. KeyTronics Corp. of Spokane, Wash., and National Registry Inc. of Tampa, Fla., offer a keyboard with an embedded fingerprint scanner. In contrast, a Sensar Secure iris scanner from Sensar Inc. of Moorestown, N.J., is a dedicated unit that is now being pitched only to automatic teller machine manufacturers.

Biometric identification systems can be used locally to secure an individual PC, Nanavati says. In a corporate setting, however, there would be more interest in using a biometric identifier in conjunction with logging on to a network. To ensure security over a network, biometric identifiers and system responses must be encrypted and time stamped so they cannot be intercepted and simply replayed at a later time. Vendors have different ways of accomplishing this, Nanavati says. Within the

Taking Action on Internet Transactions

Stand by for an e-commerce standard, but don't throw out your EDI just yet

IT MAY BE TOO SOON TO GET excited about this, given the fragility of some standards-setting bodies, but the more than 30 companies that comprise the Open Trading Protocol (OTP) Consortium recently settled on a method for worldwide retail trading over the

OPEN TRADING PROTOCOL

Internet. Based on the Extensible Markup Language (XML) information exchange standard (see "X Marks the Spot," CIO Section 2, Feb. 1, 1998), OTP targets multiple forms of electronic commerce, including those using credit cards, smart cards and the Secure Electronic Transaction (SET) specification. It also conforms to DigiCash Inc.'s electronic payment system.

According to the OTP Consortium (www.otp.org), the standard encompasses rules for the way companies and vendors make for-sale offers, purchase agreements and payments. It also governs the transfer of goods and services and their delivery and provides for receipts, multiple methods of purchase, problem resolution, and selection of payment brand (that is, which credit card) and protocol. The specification for electronic retailing was put forth for comment in January and a final version is expected to be put forth by the consortium this spring.

"We see OTP as an important stab at an area that needs standardization," says Vernon Keenan, director of Redwood City, Calif.-

based Zona Research Inc. "Proprietary, client/server commerce protocols are using the Internet today as a mere communication medium. If a standards-based protocol were to treat the Internet as a trading place, then millions of businesses could potentially benefit from this new nexus of commerce. Without standards, we see the trading potential to be severely limited."

Zona Research puts OTP in a category it calls "market maker business languages," a group that includes CommerceNet's EcoSystem and Open Buying on the Internet (OBI) from The OBI Consortium. Is OTP the replacement for EDI then? Not yet, says Keenan. Certainly if software vendors incorporate these languages into their products, both corporate purchasing agents and consumers could reap faster and cheaper ways to buy goods and services.

However, Keenan remains cautious. "The potential for OTP's success lies in its adoption by software vendors. It is technically sound, but the proof of this particular standard's viability remains to be seen." In the meantime, he expects EDI to continue as a strong standard for electronic commerce and increase in popularity over time.

So don't trash your EDI system just yet. And keep in mind that the people working to bring us a cashless society may just be the same folks who have been promising us a paperless office all these years.

—Howard Baldwin



Emerging Technology

biometric community, there's a buzz around the potential for using biometric ID systems over the Internet and some pilot projects are underway, Bowman says. But as of this writing, there has been no major commercial deployment of an Internet-based system.

Given the promise of biometrics for protecting data, established enterprise vendors are eyeing the market. Among them, Sony Corp. has developed a Fingerprint Identification Unit, for which I/O Software Inc. in Riverside, Calif., has developed a Windows NT log-on system. Oracle Corp. is working with Identix Inc. to enable fingerprint verification-controlled access to databases. And Computer Associates International Inc. partnered with National Registry to create a fingerprint authentication front end for Unicenter TNG's single sign-on option.

The Size of Your Fingertip

Even so, the biometrics market is fairly small. Card-Tech/SecureTech puts the 1996 hardware market at \$16.2 million, not including law enforcement expenditures. If computer network security applications take off, the market could grow to an estimated \$50 million in 1999. Pilots are already underway or ready to begin in several industries.

Government. The Illinois Department of Revenue has been using a voice-verification system since 1994, enabling its 600 field auditors and collectors to log on remotely to access e-mail and taxpayer records, according to John Henry, manager of the agency's technical support division. The system, from Voiceprint Security Systems of Stamford, Conn., lets Henry's group create a record for a user and enroll that person with a spoken password of his or her choice. The password usually does not change, so the user becomes familiar with it; more important, says Henry, the system's accuracy and reliability are improved with each repeated use. To date, no one has come up with a way to fool the system. They can also enroll users from other Illinois governmental agencies who are authorized to view the agency's data files because users do not need special hardware.

Banking. Barclays Bank PLC in Northampton, England, has been testing biometric technology since 1974, according to Bill Perry, senior project manager in the bank's emerging markets group. With technology improvements, Perry believes the bank will be able to find an inexpensive device with a low error rate that can be integrated easily with existing systems. Much more research is needed before the bank can achieve its long-term goal: a point-of-sale biometric system to verify the identity of millions of Barclays' credit and debit card users, who would carry smart cards that store their biometric ID. Over the past two years, the bank has installed several fingerprint and hand geometry physical access systems in one building. And it recently piloted a fingerprint system for sign-on to the bank's Windows NT networks that it plans to roll out to Perry's group by this summer.

LEADING

EDGE

Monitoring Made Simple

WHEN NETWORK MONITORING WORKS WELL, it's like having teams of elves stationed all over your network, ready to whistle at the first sign of trouble. It's important that they be elves, too, because if they're giants, they take up too much room on the monitored machine. Caravelle Inc. in Ottawa, Canada, has added its **IPNetWatcher 1.0** to its Watcher network-monitoring product line.

Running on a server, IPNetWatcher uses Java applets to monitor onsite or remote IP and simple network management protocol devices rather than any other software agents. Like traditional network-monitoring software, it can notify on-call staff through e-mail, a pager, desktop alerts or through a browser. (Your staff will like this scenario: Their pagers go off at 4 a.m., and instead of going into the office to find out what's going on, they fire up a Web browser.)

The software can also forward alerts from the IP network or remote devices to an enterprise network management system. The software starts at \$5,000, which includes five nodes; volume discounts are also available. For more information, call 613 225-1172 or visit www.caravelle.com.

Charging for Eyeballs

WE DOUBT THAT ONE OF THE BUSINESSES you wanted to branch into when you launched your Web site was ad sales. But the CEO said it had to generate income, and selling ads seemed to be the logical way to go. Even if you're only bartering bytes with business partners, you still need a way to track the incoming and outgoing information, and a traditional advertising software package is probably rooted in the print world.

AdSuite from Solbright Inc. in New York City is designed to automate the advertising sales, trafficking and billing processes for Internet-based sites. It provides Web-based management of processes, including the exchange of proposals, contracts, ad submissions and invoices. The initial module in the package, AdTraffic Manager 1.0, handles the initial ad submission process; other modules in development include AdSales Manager for sales and contract management and AdBilling Manager for invoicing.

AdSuite runs on Windows NT and Unix platforms and accepts creative assets of all kinds, including HTML banners and JavaScript applications. AdTraffic Manager will be available in June, with AdSales Manager expected by mid-summer and AdBilling Manager expected by early fall. Pricing, which starts at \$15,000, depends on the number of sites and number of administrators. For more information, call 212 673-6100 or visit www.solbright.com.



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Emerging Technology

Medicine. Scott and White Memorial Hospital and Clinic in Temple, Texas, launched a fingerprint authentication pilot in early 1998. The system will be used to secure access to electronic patient records and other applications at the 486-bed hospital, says Richard Tribble, the hospital's director of IS systems, operations and networks. The pilot, which now extends only to IS staff and two physicians, uses the single sign-on system from Computer Associates and National Registry. An early test area will probably be the emergency department, where space constraints mean multiple people use a handful of PCs, logging on and off quickly, Tribble says. Physicians view fingerprinting as less invasive than other biometrics. And Tribble believes fingerprint ID is more secure than smart card or password alone. "You can give your smart card to someone else, you can give your password to someone else...but you can't give away your finger," Tribble says.

The Eyes Don't Have It

Despite technology advancements, James Wayman, director of the National Biometric Test Center at San Jose State University, remains skeptical that biometric systems will control access to the typical corporate network unless they take into account the 10 percent of users who won't be able to make them work. Outside of a laboratory or absent careful supervision or cooperative, well-trained users, biometric error rates can increase by a hundred times, Wayman says. While not prohibitive, costs still exceed those for a PIN or password system, and deployment can be a hassle. "There are some excellent, specific uses for this stuff," he says. "I just worry about these general, broad applications where everybody is going to have one of these on their computers."

Pilot testing can help companies decide whether biometrics is right for them. American Medical Network Inc. (AMN) tested a beta of the Oracle-Identix system for securing access to patient records. The system required precise finger positioning to work correctly—something that might be OK to authenticate a database administrator but could be a hassle in a busy doctor's office. Users "might get frustrated if it didn't work right the first time," says Chris Anderson, AMN project manager, adding that AMN may consider the system for another application.

Before leaping into biometric technology, CIOs must evaluate the effectiveness of their current security systems, analysts say. They can then weigh their data's value and the likelihood of theft or misuse against the costs and potential hassles of installing a biometric ID system. Ultimately, CIOs must remember that biometrics are only one part of an enterprisewide security system. "Buying a better lock cylinder when there are big holes in your walls is not going to improve your fortress," says Illuminata's Eunice. **CIO**

Senior Writer Sari Kalin can be reached at skalin@cio.com.

LEADING

EDGE

Protection Against Bad Java

YOU CAN'T WATCH ALL YOUR EMPLOYEES while they're surfing the Web and downloading Java-based applications (they may really have a business reason for doing this, as you well know). And when they're on the road using laptops, you can't protect them. Furthermore, you never know when a badly written or insidious applet is going to wreak havoc with their machines. How do you provide security for these issues?

In response to this problem, Santa Clara, Calif.-based Finjan Inc. has consolidated the technology behind two of its products, **SurfinGate** and **SurfinShield**, into **SurfinSuite**, a security package to protect users from downloading misbehaving Java, ActiveX, JavaScript or Visual Basic Script applications as well as cookies and plug-ins. The consolidated product works on servers, desktops and laptops, so CIOs can enforce security rules even when users are on the road or working from home with corporate machines. You can set up either a single corporate security policy or adjust policy depending on users' access privileges or responsibilities.

Pricing for SurfinSuite has not been determined but will be based on the number of seats. For more information, call 408 727-8120 or visit www.finjan.com.

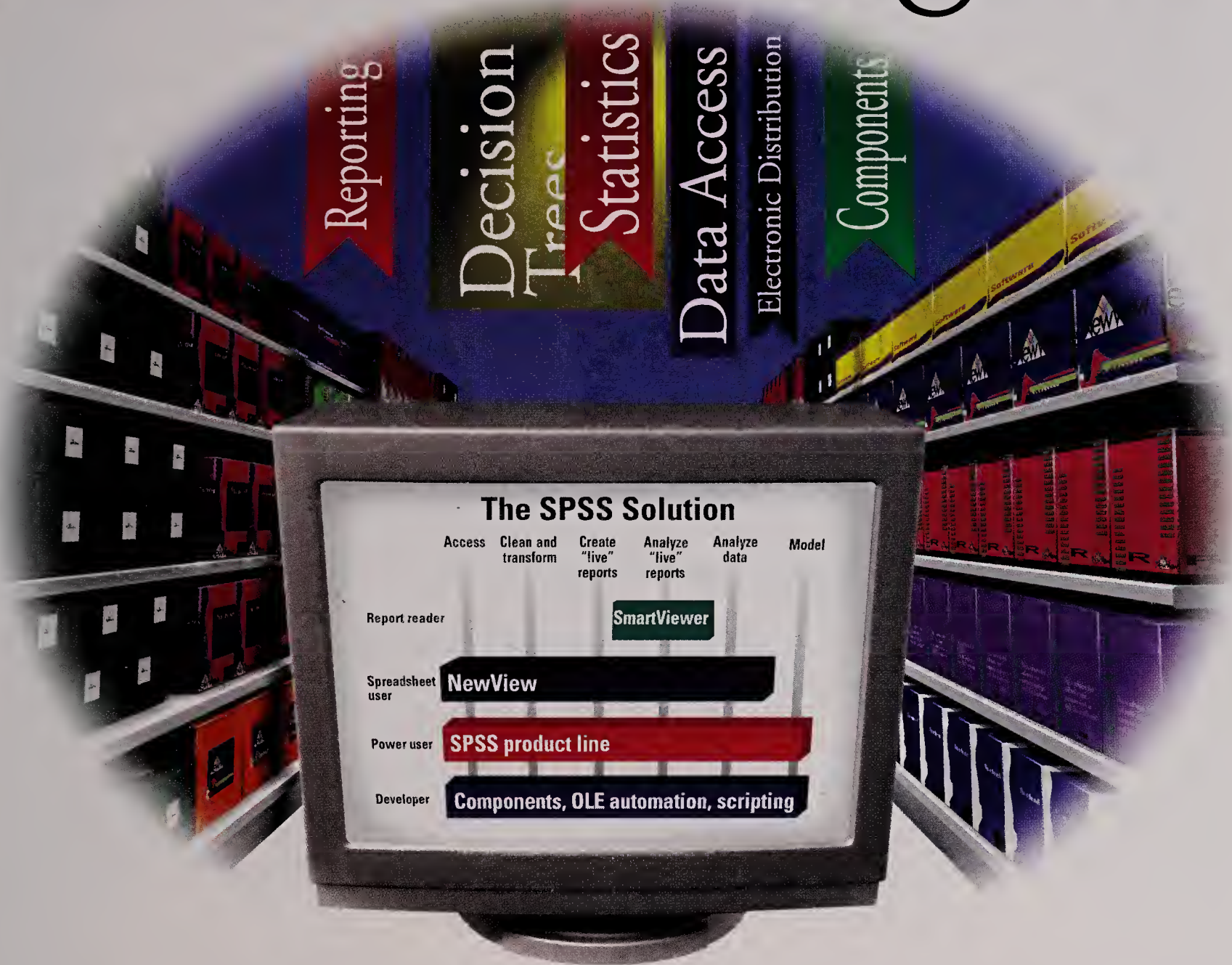
Really Sexy Monitors

WHERE DO FLAT-PANEL MONITORS GO? Companies like Samsung Electronics America Inc. in Ridgefield Park, N.J., think they're used in the financial and health-care industries, but we suspect they end up in two places—on CEOs' desks because they look really sleek and stuffed into the closet with the punchdown blocks because there's no room for anything else.

Samsung's new 14-inch **SyncMaster 400TFT** and 15-inch **SyncMaster 500TFT** carry hefty price tags like all flat-panel monitors (\$2,379 and \$2,999, respectively), but they also incorporate universal serial bus connections for peripherals, built-in speakers, onscreen controls and energy-efficient power consumption. They are only 2.5 inches thick (8.7 inches if you use the base), weigh just more than 8 pounds and offer screen resolutions of up to 1,024 pixels by 768 pixels. For more information, call 800 933-4110 or visit www.sosimple.com.



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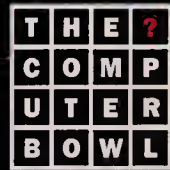
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MAXIMIZING THE PAYOFF FROM I.T.

UNIVERSITIES MAY HAVE well-equipped computer labs and classrooms, but many lag behind the times when it comes to providing students, faculty and staff the kind of administrative systems that can improve efficiency. As they had for decades, students at the Orlando-based University of Central Florida (UCF) used to participate in the time-honored tradition of waiting in line to register for classes, pay tuition bills and the like. Since fall 1997, when the university augmented existing systems with secure, intranet-based applications, the administrative aspects of academic life have gotten easier.

Registering for classes is a simple, relatively repetitive task that's essentially an interactive event among students, faculty and members of the administration. For years, UCF offered a touch-tone telephone registration system so students could call to sign up for classes. (Of the current enrollment of 28,400 students, only 1,700 live on campus.) Yet such a system didn't alleviate the need to physically wait in line because other, related bits of information were not readily accessible. "Class schedules were not easily available, so there were often delays not only in registering for classes but in getting accurate financial aid status information and invoices," recalls William H. Branch, UCF's director of computer services and telecommunications. For many students, the end result of using the touch-tone system often meant waiting for information to arrive through the mail or waiting their turn at the end of a line somewhere on campus.

A couple of years ago, UCF President John Hitt decided to create a network-centric university so that necessary infor-

The University of Central Florida's Intranet-Based Administration Application

Vital Statistics:

- **Organization:** University of Central Florida, Orlando
- **Application:** An intranet-based administration system
- **Technologies:** The Internet; middleware from ClientSoft Inc. that integrates existing applications from an IBM ES/9000 mainframe and AS/400 systems; help desk software from Remedy Corp.; a computer-based training package from CBT Systems Ltd.; document management software from Mosaix Inc.
- **Scope:** 28,400 students and 4,000 employees
- **Sponsors:** John Hitt, president; Joel L. Hartman, vice provost; and William H. Branch, director of computer services and telecommunications
- **Objective:** Provide students and staff with quick access to personal and academic information
- **Payoff:** Cost-effectively integrated legacy applications through an intranet; paved the way for building more intranet-based administrative applications

mation would be available to both students and staff via the Web. He put Vice Provost Joel L. Hartman in charge of the Information Technology and Resources division, including the library, instructional media and all computers and telecommunications on campus. The university spent about \$2 million to establish the connectivity infrastructure, including upgrading all local area networks among campus buildings from 10MB to more than 100MB.

One issue that cropped up was inte-

grating UCF's legacy financial and administrative systems into this new infrastructure. Branch says this problem was solved through the use of ClientBuilder WebPack, a middleware product from ClientSoft Inc. of Tarrytown, N.Y., that enabled legacy data from 3270 screens to be presented to end users on a single GUI-based screen. The middleware is the glue that holds together the Personal On-Line Access to Restricted Information System, better known as Polaris.

Through Polaris, UCF integrates administrative information from an IBM ES/9000 mainframe and AS/400 systems and links it to a SQL server. Polaris also makes that information available to students and staff over the Internet. The Polaris intranet also includes ViewStar document management software from Mosaix Inc. in Redmond, Wash.; a computer-based training package from CBT Systems Ltd. of Menlo Park, Calif.; and help desk software from Remedy Corp. in Mountain View, Calif.

Faculty and administrators use Polaris to access the information most relevant to them, including class rolls, departmental accounts and personnel data.

Polaris will continue to be enhanced as UCF adds more applications. "We're in the process of implementing PeopleSoft's student administration system that will make it even easier for everyone to get at more information," Branch adds. UCF intends to support as many Web-based applications as possible, he says.

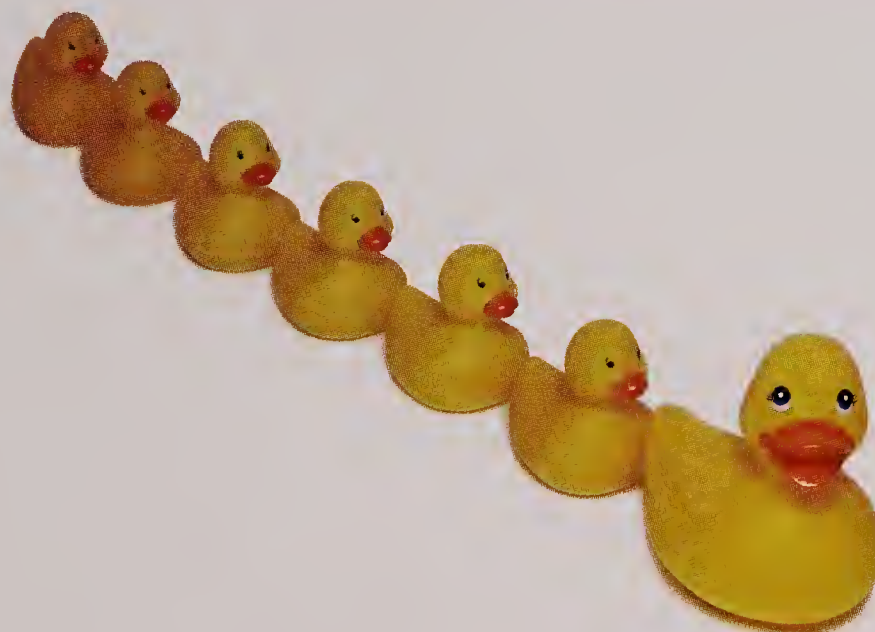
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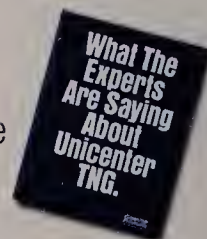
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